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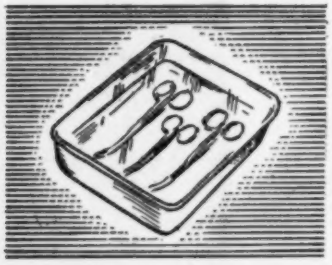

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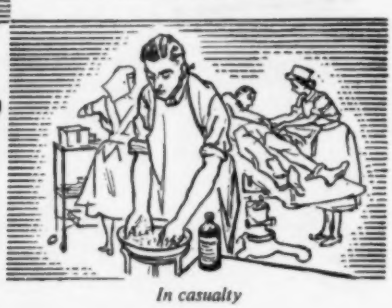

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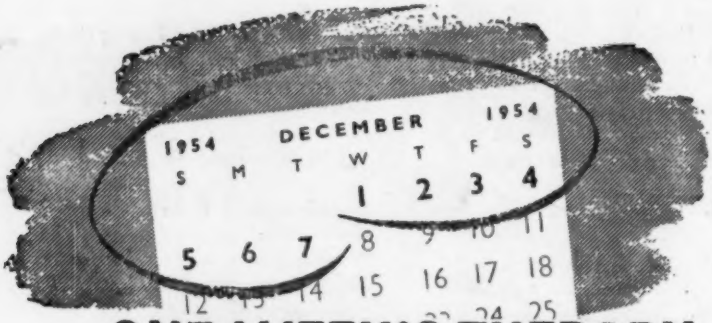

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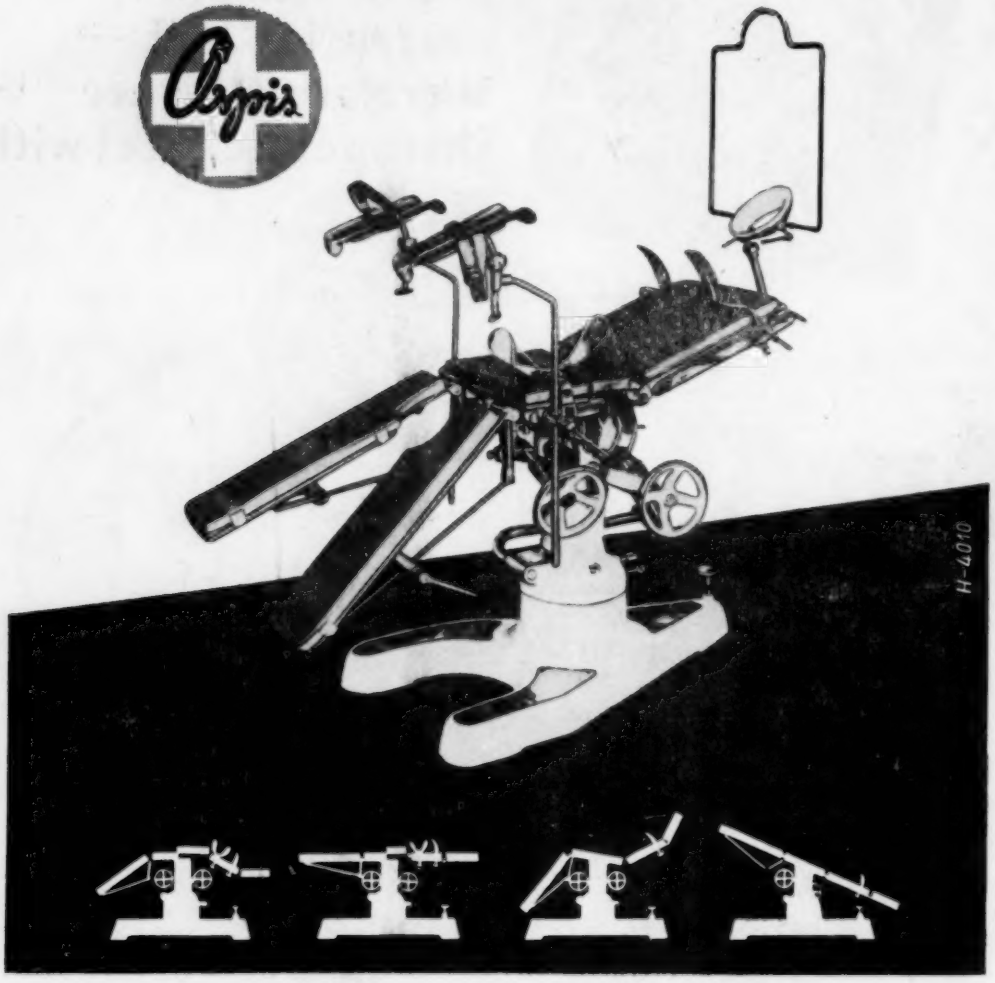

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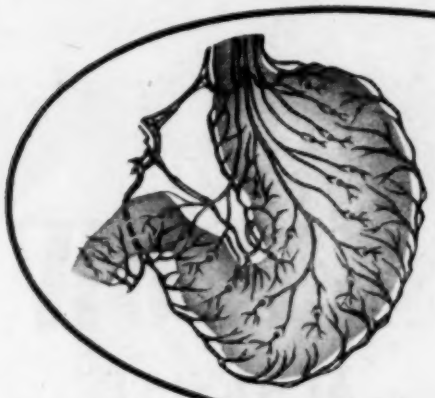

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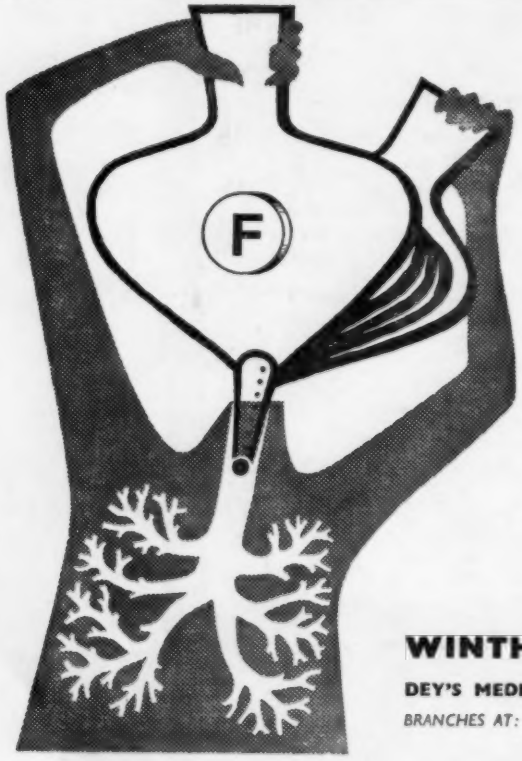

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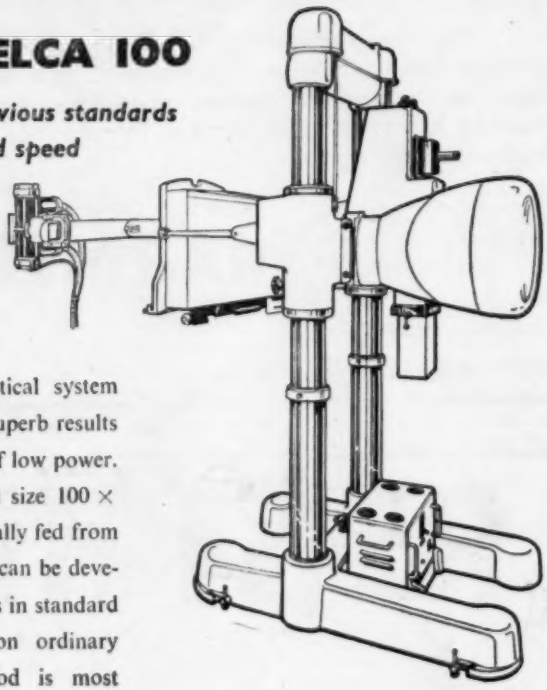

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ORIGINAL ARTICLES

STUDIES ON THE HEXACANTH EMBRYO OF *TAENIA SAGINATA* AND ITS ENCLOSING MEMBRANES

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The present state of knowledge about the hexacanth embryo of *Taenia saginata*, one of the commonest cyclophylidean cestodes infesting the human race, is mainly centred round its morphological architecture. Its physiological and biological activities have received very little attention. Silverman (1954) in course of his investigations on the mode of activation of *Taenia* eggs made a passing reference to the histochemical character of the embryo, and in a later publication (1955) dealt with the significance of the polysaccharide complex present in the embryo.

Some preliminary observations on the histochemical make-up of this embryo and its enclosing membranes were recorded by us in previous communications (Chowdhury *et al*, 1955 & 1956). The details of the said work and the results of further investigations are described in this paper. The probable physiological significance of the morphological localisation of different microchemical constituents has also been discussed here.

Material and Method

Living gravid proglottids of *Taenia saginata* freshly passed by the patients admitted in the Carmichael Hospital for Tropical Diseases, Calcutta, were used as the test material in these investigations. Fresh smears made of the material containing the eggs teased out of the proglottids and also the entire proglottids were fixed in chilled 80 per cent alcohol, in Carnoy's fluid, in Serra's fluid and also in alcohol-neutral formalin mixture (9 : 1). The fixed proglottids were cleared in benzol, embedded in 'tissuemat' at 58°C and serial sections were obtained 5-7 μ thick. Those fixed in Carnoy's fluid, Serra's fluid and in chilled 80 per cent alcohol were stained with Unna-Pappenheim stain, toluidene blue, and were also subjected to Feulgen's technique to study the distribution of nucleic acids. The same were also subjected to Danielli's coupled tetrazonium reaction (Danielli, 1953) for simple proteins (tyrosine, tryptophan and histidine). To study the distribution of general polysaccharides, the material fixed in alcohol-neutral formalin was subjected to Hotchkiss technique (Glick, 1949). For detecting glycogen, Bauer-Feulgen technique described by Bensley (1939) was followed, while for the hyaluronic acid type of polysaccharide Hale's method (1946) was adopted. For the alkaline and the acid phosphatase activities Gomori's techniques as outlined by Glick (*loc. cit.*) were followed.

Observations

The outermost covering of the eggs enclosing the hexacanth embryo (Fig. 1) is designated as the

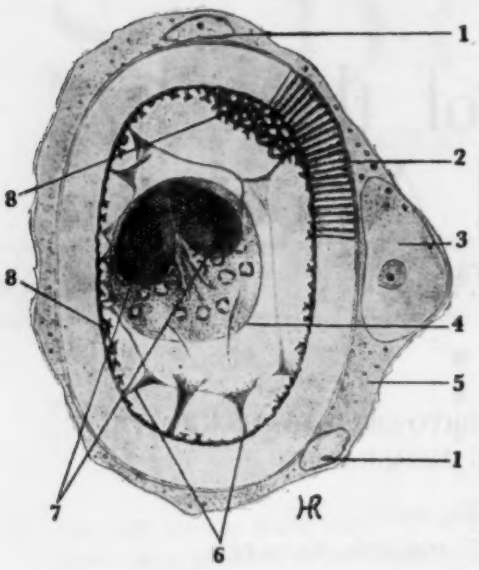

FIG. 1—HEXACANTH EMBRYO OF *Taenia saginata* (SEMI-DIAGRAMMATIC, NOT TO SCALE)

1—Nucleus of the chorionic membrane. 2—Canaliculi in the embryophore containing the metachromatic granular extension of the basement membrane. 3—'Yolk cell'. 4—Limiting membrane. 5—Chorionic membrane. 6—Onchospheric membrane attached to the basement membrane. 7—Bilobed metachromatic glands. 8—Honeycomb like arrangement of the basement membrane.

chorionic membrane. The structure of this membrane could be studied clearly in smear preparations. This membrane surrounded each hexacanth, enclosed in thick shell called embryophore, and the membranes of the adjacent hexacanths firmly adhered to each other often giving rise to the appearance of a beaded chain. The point of interest was that the membrane was found to be nucleated. Two nuclei (Fig. 2, *vide* Plate) could usually be detected in the chorionic membrane of a single hexacanth. The extranuclear portion of the membrane lodged in them a number of granules which were positive to Hotchkiss reaction. These granules also took up deep orthochromatic stain with toluidene blue and also took up pyronin stain. The chorionic membrane and its residual attachments could also be seen as made up of simple proteins.

The 'yolk cell' lying in the space in between the embryophore and the chorionic membrane had a large nucleus. The cytoplasm of the cell exhibited a blank appearance. It did not take up toluidene blue or pyronin and was also negative to Hotchkiss reaction except for a mild reacting zone along the periphery. The nuclear membrane, on the contrary, was strongly positive to the above reaction.

The embryophore was found to consist of numerous radially arranged wedge-shaped blocks, internal to which was a membrane termed the basement membrane as described by Silverman (1954). The most striking observation made by us was that, the substance of the basement membrane not only lined the internal surface of the embryophore, but also permeated the very narrow canaliculi which existed in between the individual wedge-shaped blocks of the embryophore. In tangenital sections the basement membrane assumed a honeycomb appearance (Fig. 3, *vide* Plate). With toluidene blue stain it appeared that the substance of the basement membrane was sprinkled with a liberal amount of mucopolysaccharide arranged in an anastomosing fashion which seemed to fill up nearly the whole of it. In the narrow canaliculi in between the individual blocks of the embryophore extremely minute metachromatic granules could also be noticed. Prominent nuclei positive to Feulgen technique could be detected in the basement membrane when the embryophore was not mature. However, when the embryophore was well-established, very small Feulgen-positive particles bestrewn throughout the substance of the basement membrane could only be detected. The basement membrane revealed light reaction for RNA, a very prominent reaction for simple proteins, glycogen and also for hyaluronic acid type of polysaccharide.

The onchosphere could be detected on the inner aspect of the basement membrane enclosing the hexacanth embryo. It consisted of an outer layer called the onchospheral membrane and an inner layer called the limiting membrane. The onchosphere contained copious amount of ribonucleic acid as suggested by intense stain with pyronin. This also showed intense positive reaction for simple proteins and also for glycogen, mucopolysaccharide and hyaluronic acid type polysaccharide.

An interesting finding was that the onchospheral membrane was found to be attached to the basement membrane by one or more pedicle or stalk rich in polysaccharide which simulated placental attachments. At times communicating strands, though few in number, occurred between the onchospheral membrane and the basement membrane. These were also rich in polysaccharide.

The fluid which occurred between the chorion and the embryophore and that inside the embryophore were slightly positive to Hotchkiss reaction.

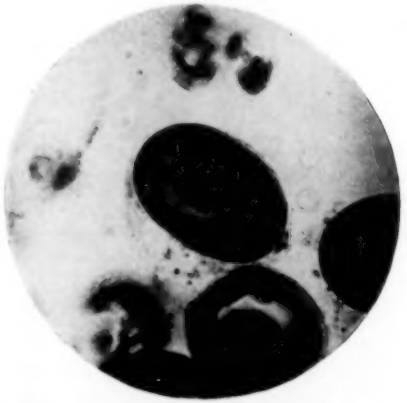

Fig. 2—Hexacanth embryo in the centre enveloped by the outermost chorionic membrane. Note the 'yolk cell' and nuclei of the chorionic membrane. ×*c* 600.

Fig. 3—Tangential section showing honeycomb like appearance of the basement membrane. Note the radially arranged granular structures along the canaliculi separating the blocks of the embryophore. ×*c* 1400.

Fig. 4—Transverse section showing bilobed gland in the hexacanth embryo. ×*c* 1400.

CHOWDHURY ET AL—*Studies on Hexacanth Embryo of T. saginata and Its Enclosing Membranes (pp. 295-301)*

Fig. 2—Probe has passed into the proximal orifice of the fistula. The perineal urethrostomy catheter is seen behind the scrotum (Case 1).

Fig. 4—There is no leak at the site of the fistula and the urinary stream is broad and normal (Case 1).

Fig. 5—Shows the fistulous opening closed and the perineal urethrostomy catheter *in situ* (Case 2).

MOHAN RAU—*Denis Browne's Operation as Applied to Penile Urethral Fistulae (pp. 301-303)*

Fig. 6 a—Urethrogram done on Case 2, ten months after the operation. Showing a bulge at the site of repair.

Fig. 6 b—This picture was taken after the contrast medium was voided. Note the residual contrast medium, stagnant at the site of the old urethral fistula.

MOHAN RAU—*Denis Browne's Operation as Applied to Penile Urethral Fistulae (pp. 301-303)*

Fig. 1—Anterior view showing a single head, four hands and four legs.

Fig. 2—Posterior view showing a broadened skull with a growth at its mid-posterior region.

MAZUMDAR—*Conjoined Twins in a Case of Triplets (pp. 313-14)*

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The nuclei of the embryo contained desoxyribonucleic acid as indicated by positive reaction to Feulgen's technique and also by methyl green stain. Inside the nuclei, DNA could easily be seen as small, but compact aggregates, at times joined together, and arranged at the periphery. Inside each nucleus a large pyroninophilic area could be detected. Some larger cells of the embryo, took up intense pyronin stain in the cytoplasm. These cells stood in sharp contrast to the rest.

Alkaline phosphatase appeared to be active in the nuclei of the embryo, and also in the cytoplasm in less intensity. Acid phosphatase reaction was entirely negative.

The cytoplasm of the cells of the embryo was packed with polysaccharides which included glycogen as determined by Bauer-Feulgen technique. In materials treated with Hotchkiss technique and counterstained with toluidene blue the entire embryo appeared as a bright red mass interspersed with deep blue nuclei. The hooks of the embryo could also be seen as positive to the Hotchkiss reaction. With Danielli's coupled tetrazonium reaction, the entire embryo yielded positive reaction for simple proteins and assumed bright yellow colour. Mucopolysaccharide appeared as violet metachromatic granules in the cells of the embryo, the amount and the distribution of which, however, varied widely in embryos of various stages of development, the intensity appearing to be maximum at the most advanced stage.

The structures described in details as bilobed glands (Silverman, 1954, 1955) could be detected easily in toluidene blue preparations. Here, these appeared as deeply metachromatic bilobed bodies occupying a considerable area inside the onchosphere (Fig. 4, *vide* Plate). With Danielli's coupled tetrazonium reaction for simple proteins, the sites of these bilobed bodies could be detected as being deeper yellow in colour than the rest of the mass.

Discussion

The outermost covering of the hexacanth called the chorion was noticed and referred to by previous authors, but the details of its structure has been wanting. Silverman (1954) described it as a fragile membrane not often seen in faecal smears and enclosing the yolk substance, which due to its adhesive nature, caused the eggs to clump together.

Our studies indicate that the chorionic membrane is living in nature. At the early stages of the development of the egg this membrane encloses the yolk material and serves as a protective covering. In fully-grown hexacanths the 'yolk cell' is found to be depleted of yolk content but the presence of the chorionic membrane still appears to be important. The minute canaliculi that traverse the thick embryophore establish a direct passage which link the intra-embryophore material with the fluid that occurs in between the chorionic membrane and the embryophore. The embryophore remains bathed in this fluid and the chorion serves to retain this fluid.

According to Silverman (1954) the embryophore and the cementing substance were secreted by the basement membrane. We found the basement membrane to be a cellular substance which actually held together the individual blocks of the embryophore, thus serving as the binding material. In the case of early embryophore the basement membrane was found to possess prominent nuclei, but when the embryophore was well-developed the structure of the nuclei became obscure. It appeared that the basement membrane was actually contributing to the formation of the embryophore, and in this process it was gradually using itself up. The basement membrane moreover constituted a cellular link between the embryo and the extra-embryophore area. The presence of attachments between the basement membrane and the onchosphere and also the occurrence of occasional communicating strands rich in polysaccharide, connecting these two structures appeared significant. The presence of copious amount of RNA and polysaccharide in the onchosphere indicated it as the site where metabolism was going on at a rapid pace. It appeared quite likely that the onchosphere actually received nourishment from the basement membrane, through the points of attachment and the communicating strands.

The Hotchkiss-positive appearance of the fluid which occurred between the chorionic membrane and the embryophore and also that between the basement membrane and the onchosphere seemed to point to their nutritive role. In addition to this nutritive role, it appeared that the above fluid also served to safeguard the embryo against mechanical shock and prevent drying up of the delicate membranes.

The hyaluronic acid type of polysaccharide present in the basement membrane and in the onchosphere possibly served to ensure safe passage of the hexacanth through the acidic medium of the stomach of the vertebrate host.

The larger pyroninophilic cells in the embryo observed by us corresponded to the 'polar cells' (Silverman, 1954) and considerable concentration of RNA in their cytoplasm was indicated. These 'polar cells', according to Silverman, formed around small 'blue green' cells, which represented centres of DNA.

The 'blue green' staining reaction of cells was however not clear to us. Silverman did not elaborate his statement and it is not clear whether this particular type of colour reaction was noticed in the nuclei of the cells referred to, or in the cytoplasm thereof, or whether the statement covered the cells as a whole. If the cells as a whole looked 'blue green' then it should be assumed that DNA was present in the cytoplasm of these cells, a feature, which, if true, must be considered as an unique occurrence. In our Feulgen preparations and pyronin methyl green preparations we, however, failed to locate any trace of DNA outside the nuclei of the embryo.

As regards the function of the pyroninophilic polar cells Silverman noted that they were never seen in an obvious state of division and was inclined to believe that the further growth of the embryo was more likely to be derived from the combined activity of the small blue-green cells and certain cytoplasmic components rich in RNA, than from the division of the large red cells. This conclusion, however, is at variance with the observations of various authors quoted by Silverman (Vogel, 1929, 1930 ; Michajlow, 1933, Wisniewski, 1930 ; Stunkard, 1934 ; and Venard, 1938) who distinguished in various taeneid hexacanth embryos large red cells sometimes termed 'plastin cells' and also small blue cells. The small cells were generally considered to be somatic ones and the large plastin cells to be potentially germinative and thought to be capable of division.

The structures described at length by Silverman (1954, 1955) as bilobed glands were found by us to be very rich in mucopolysaccharide as evidenced by intense metachromasia observed with toluidene blue stain. Silverman (1955) found these structures to be positive to periodic acid-Schiff reaction and postulated the presence of polysaccharide complexes in these bodies. These polysaccharide complexes, according to him, were in some way related to immunogenic properties.

It seems to us that mucopolysaccharide, a heparin-like substance, possibly plays a definite role in the defense mechanism of the hexacanth embryo against external factors as noticed in certain parasitic protozoa (Gill and Ray, 1954 ; Sen, Ray and Dutta, 1954; Dasgupta *et al*, 1955). It also appears likely that by dint of its hydrotropic nature the mucopolysaccharide helps to create a fluid zone around the hexacanth, thus facilitating osmosis between the embryo and its environment.

It may not be out of place to mention that Vogel (1929) in his studies on the eggs of *Diphyllobothrium latum* showed that a higher pressure was present inside the egg than that exerted by water on the egg shell. The former markedly supported the emergence of the larva.

The possibility of the existence of a similar pressure within the embryophore of the hexacanth larva of *T. saginata* remains to be examined and it does not appear unlikely that mucopolysaccharide by continued absorption of fluid substance might set up a pressure, thus constituting a contributory factor to the disintegration process of the embryophore at the appropriate hour.

Summary

1. The chorion is described as a nucleated structure and containing polysaccharide granules. The nuclear membrane of the 'yolk cell' is described as containing polysaccharides.

2. The basement membrane is shown as extending into the minute canaliculi that separate individual blocks of embryophore, thus establishing a link between the embryo and the outside. The membrane is rich in mucopolysaccharide and at the early stage of development it is nucleated.

The onchosphere is found to be connected to the basement membrane by one or more pedicles or stalks and by certain communicating strands, all rich in polysaccharides. It is suggested that the embryo receives nourishment through these connections and the role of intra-chorionic and intra-embryophore fluid in this regard is stressed.

4. The presence of profuse amount of mucopolysaccharide in the embryo is reported. It is suggested that this may have a definite role in the defense mechanism of the hexacanth and may promote osmosis between the embryo and its environment. That mucopolysaccharide may setup a pressure inside the embryo by virtue of its hydrotropic property is mentioned as a possibility.

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DENIS BROWNE'S OPERATION AS APPLIED TO PENILE URETHRAL FISTULAE

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The treatment of traumatic penile urethral fistulae has always been beset with difficulties and disappointments. The thinness and fragility of the penile skin, the difficulty in getting sufficient skin for apposition without tension, and the presence of erectile tissue in close proximity have made successful 'takes' after suturing rather infrequent in this region, especially at the base of the penis.

The plastic operations practised by many for the treatment of hypospadias have met with a fair degree of success for cases of urethral fistulae. However, the procedures described are time-consuming and complicated, and generally several operations are necessary before a successful and permanent closure of the fistula is obtained. In all the techniques, the urethral canal was reconstructed at the time of the operation.

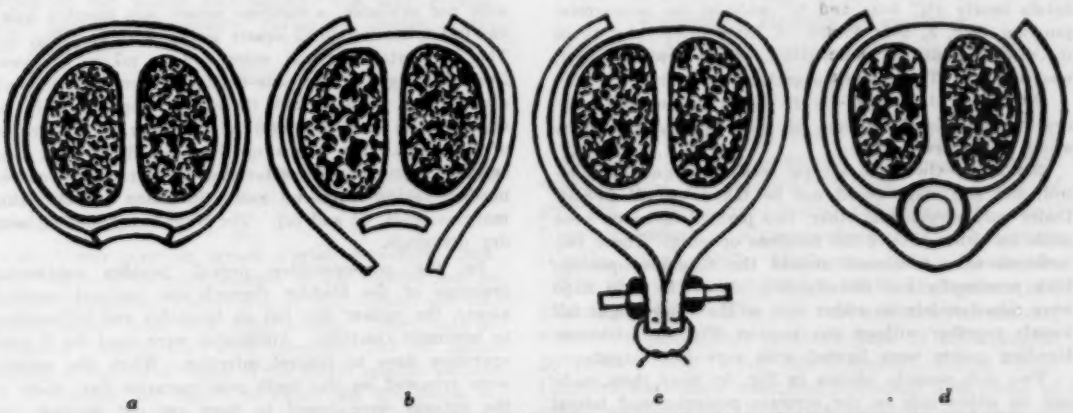
Browne (1949) described his operation for hypospadias, in which procedure a strip of skin on the under aspect of the penis was 'buried' subcutaneously and was allowed to form a urethral canal, by itself, by the outgrowth of epithelium. (Figs. 1—a, b, c and d.)

Since then, several authors (Connolly, 1953-54 ; Burns, 1949 ; Fogh-Anderson, 1953) have reported the early and late results for the treatment of hypospadias using this technique. The results have been most satisfactory. There has been no secondary shrinkage of the buried skin and the newly formed urethra has shown a normal calibre.

In a small percentage of the cases operated upon (Browne, 1949) penile urethral fistulae developed in the post-operative period. These were easily closed by an adaptation of the same principle. We have used the same technique (*vide infra*) in 2 cases of traumatic urethral fistula, and the results have been very gratifying. The cases with our comments are reported.

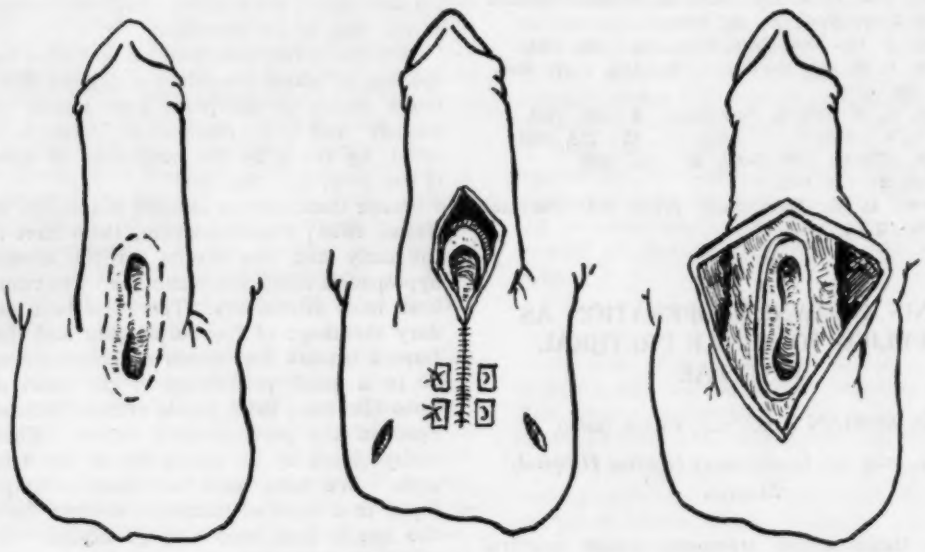
CASE REPORTS

Case 1—A, aged 15 years, was admitted for a urinary fistula at the penoscrotal junction. In November 1952, he fell astride a narrow bridge and injured his perineum. There was an external injury. He noticed a few drops of blood at the external meatus soon after the injury. The next day, the patient was admitted into a hospital near his place, as he had developed acute retention of urine. Here a catheter was passed and this was left *in situ* for one week. The fistula at the penoscrotal junction developed while the catheter was in position. An unsuccessful attempt was made to repair the fistula, in the same hospital. The patient got himself discharged soon after.



a *b* *c* *d*

FIG. 1—DIAGRAMMATIC REPRESENTATION OF ESSENTIAL STEPS IN DENIS BROWNE'S OPERATION FOR HYPOSPADIAS.
a—A cross-section across the penile shaft. The strip of skin to be 'buried' is outlined in the ventral aspect. *b*—The two flaps of skin and subcutaneous tissue have been raised on either side of the strip of skin outlined in *a*. *c*—The lateral flaps have been united leaving a strip of skin 'buried'. *d*—The new urethral canal completely formed by the 'buried' strip of skin.



a *b* *c*

FIG. 3—SHOWS THE STEPS IN THE REPAIR OF THE URETHRAL FISTULA IN CASE 1.

a—Note the urethral fistula at the penoscrotal junction. The dotted line indicates the incision.
b—The skin flaps have been raised widely on either side and also proximal and distal to the fistula.
c—The suturing of flaps done (for the purpose of clarity, the distal portion left unsutured shows at the depth, the 'buried' mucous membrane at the site of the urethral fistula).

In August, 1953, the patient was admitted into another hospital, where, after a preliminary suprapubic cystostomy, a repair of the urethral fistula was attempted, using a pedicle graft from the skin in the neighbourhood of the penile shaft. The operation was not successful.

The patient came under our care on 19-6-54. The suprapubic wound had healed completely by then (as the suprapubic catheter had been removed before his discharge from the second hospital). He had a urethral fistula nearly 1¼" long and ½" wide at the penoscrotal junction (Fig. 2, *vide* Plate). A little more than ½ of the circumference of the urethra, on its ventral aspect, was missing. There was no urethral stricture.

Operation: *1st stage*—On 19-7-54, a preliminary perineal urethrostomy drainage of the bladder, was done, using a diathermy knife.

2nd stage—Owing to several reasons beyond our control, the 2nd stage could not be taken up till 24-8-54. Under gas, oxygen and ether, two parallel incisions were made on either side of the fistulous opening. These two incisions were continued around the fistulous opening, both proximally and distally (Fig. 3a). The skin flaps were raised widely on either side so that they might fall loosely together without any tension (Fig. 3b). Obvious bleeding points were ligated with very fine catgut.

Two stab wounds (shown in Fig. 3c) were then made one on either side in the scrotum posterior and lateral to the proximal posterior angle of the flaps and the tissues were undermined to connect with the under surface of the flaps. Rubber drains were inserted here to allow the escape of any blood that might accumulate under the flaps. A relaxing incision was then made on the dorsum of the penile skin (as in Fig. 1 b and c) and this was spread open widely. This further minimised tension on the suture line, after closure of the lateral flaps.

The next step was approximation of the lateral flaps. This was accomplished by a double layer of sutures, as indicated diagrammatically in Fig. 1c. Since aluminium or lead beads, similar to the ones used by Browne were not available, a mattress suture was inserted using fine 000 nylon and small square pieces of rubber (Fig. 3c). The horizontal mattress sutures were taken ½" away from the edges of the skin-flaps and were tied in such a way that when locked there was approximately an eighth of an inch (0·3 cm.) left between the two edges of the flaps. The edges of the skin flaps were then sutured together with 000 catgut on atraumatic curved needle, taking care to avoid inversion of the skin margins (Figs. 1c and 3c). The wound was dressed with dry dressings.

In the post-operative period, besides continuous drainage of the bladder through the perineal urethrostomy, the patient was put on bromides and stilboesterol to minimise erections. Antibiotics were used for 8 post-operative days to control infection. When the sutures were removed on the tenth post-operative day, some of the sutures were found to have cut out through the edges of the flaps. The greater portion of the flaps had united completely.

3rd stage—After an interval of a few weeks the now very small fistulous opening was completely and

successfully closed by a repetition of this operation. The perineal urethrostomy tube was removed on the 14th post-operative day, and this wound healed promptly after that. The patient was able to pass urine in a good stream (Fig. 4, *vide* Plate).

Case 2—Mr. C, aged 25 years, was admitted into General Hospital, Madras on 7-1-55. He gave a history of being involved in an accident in May 1954 when his perineum was injured. He was taken to a nearby hospital, where, among other things, a suprapubic cystostomy drainage of the bladder was done and multiple incisions were made for relief of extravasation of urine. About 10 days later, as he was still not able to pass urine *per vias naturalis*, a catheter was passed through his urethra and was left *in situ*. Three days later, a swelling appeared near the penoscrotal junction which later burst, discharging pus and urine. When the catheter was removed soon afterwards, the patient noticed that he was passing urine both through the external urinary meatus and through an abnormal opening at the penoscrotal junction. Two attempts at closure of this opening did not succeed.

When he was first seen by us, he had a urethral fistula (about ½" long and ½" wide) at the penoscrotal junction. During the act of micturition about 20 per cent of the urine was coming through this orifice in a continuous stream; the rest of the urine was coming out through the external meatus.

Apart from scars of the previous operations, and the presence of a very small rectourethral fistula, there was no other abnormality.

On 22-1-55 under general anaesthesia a preliminary perineal urethrostomy was done. Then the urethral fistula was closed (Fig. 5, *vide* Plate), using the technique described under the first case.

The same postoperative care was bestowed on this patient. The stitches were removed on the tenth post-operative day. Except for a very tiny orifice, the greater portion of the wound had healed. The tiny residual orifice, healed spontaneously, during the course of the next four days.

Follow-up Results

Case 1 wrote to us a year after the operation stating that he had no trouble and that he was passing urine in a good stream.

Case 2 was seen in person during November 1955. There had been no recrudescence of the trouble and no stricture formation. The region of the fistula and the perineal wound were both quite supple. There was no mechanical interference with erection. But a bulge appeared at the site of repair of the fistula and the patient had to squeeze this region to expel the few drops of urine that stagnated there at the end of micturition. The weakness of the urethral floor at this site and the dilated state of the urethral lumen were well seen in the urethrograms (Figs. 6 a and b, *vide* Plate).

Comments

The operations were technically easy to perform. Non-familiarity with the details of the technique necessitated a three-stage operation for the first case. The second stage, i.e., operative repair of the fistula could have been carried out along with the first stage. The third stage could have been easily avoided if an excess tension in the approximation of the flaps had been avoided during the second stage. In the second case, in one sitting, after a preliminary urethrostomy drainage, the urethral defect was completely closed.

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MALIGNANT DISEASE PRESENTING AS OBSCURE PYREXIA

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Physicians are well aware of the difficulties in diagnosing certain obscure fever. Malignant disease is a well-known, though rare, cause of pyrexia. There are many references to renal hypernephroma as a cause of pyrexia in literature (Catlin, *et al*, 1947 ; McCague, 1940 ; Rowlands, 1951 ; Shackman and Daniel, 1953 ; Hempstead and Priestley, 1952). The last two authors recommend excretory pyelogram in every case of unexplained pyrexia. They have also quoted Israel from German literature who had reviewed 146 cases of renal neoplasm in 1911, and noted 8·7 per cent of cases with fever who underwent operation. Israel then concluded that fever in association with hypernephroma is not always related to histological

findings, secondary changes in the tumour or bacterial invasion. Shackman and Daniel (1953) observed temperatures ranging from 99° to 100°F. in many of their cases of carcinoma of renal parenchyma, tumours of renal pelvis and renal embryomas. They are of the opinion that fever may be due to extensive necrosis in the primary tumour and may be associated with extensive secondary deposits in the lungs.

Various theories are propounded to explain the rise in temperature, the commonest being the production of toxins by necrotic tissue, and the secondary infection, which for example is seen so often with bronchial carcinoma and subsides with the administration of antibiotics. McCague (1940) is of the opinion that fever is due to anaphylactic reaction from the toxic absorption of foreign material in the tumour mass. When the fever does not subside after nephrectomy, metastases should be suspected. He also postulates that there is a change in the body economy due to differences in the metabolism between neoplastic and normal cells which produces the variation in temperature.

Clanton (1950) in a series of 64 patients with carcinoma of the rectum and colon noted that there were 70·3 per cent cases with pyrexia for which there was no other explanation ; 4·9 per cent represented the cases where fever was the only symptom. He quotes Briggs who made a study of fever in 238 cases of carcinoma arising from various sites, and noticed rise of temperature in over a third of the cases. But contrary to McCague, he states that metastases have little to do with the rise of temperature. Clanton also recommends complete proctosigmoidoscopic examination, barium enema followed by air contrast and cytological examination of rectal mucus for malignant cells, in cases of unexplained pyrexia.

Henley (1948) also described pyrexia in perirenal fibrosarcoma. Fein and Schulman (1951) mentioned a case of abdominal reticulum-cell-sarcoma in an Indian Moslem in America whose predominant symptom was pyrexia between 100° and 105°F. Fever also occurs with malignant lymphomas. Osteogenic sarcoma and Ewing's tumour can also give rise to fever (Boyd, 1948).

The purpose of this paper is to describe cases which presented as obscure pyrexia.

Case Reports

Case 1—A man, aged 59, was admitted complaining of pyrexia of over two weeks' duration and listlessness for a month. He had always been of slim build, but thought he had lost a few pounds in weight. On examination he had intermittent pyrexia between normal and 103°F. No other abnormality was detected.

Investigations—Hb. 76 per cent, R.B.C. 4 million/c.mm., W.B.C. 12,600/c.mm. (normal differential), E.S.R. 50 mm. in 1 hour (Westergren). Repeated blood cultures, agglutination tests were negative. No radiological abnormality was found in the chest. As he had slight leucocytosis, his fever was thought to be infective in nature and penicillin was given without effect. He complained of a dull ache just above the umbilicus and was tender on moderate pressure. He then started to deteriorate rapidly. Further investigations were : Hb. 72 per cent, W.B.C. 13,000/c.mm., E.S.R. 80 mm. in 1 hour. Liver function tests, serum proteins and barium follow-through were negative.

A tentative diagnosis of malignant retroperitoneal tumour was made and exploratory laparotomy was done. There was a carcinoma of the body of the pancreas with metastases in the liver and omentum. The patient died after two weeks.

Case 2—A man, aged 51, was complaining of weakness and pyrexia off and on for over 4 months. He had bronchitis for 10 years and was coughing up frothy sputum, about 2 ounces daily, without any blood. He had always been of thin build but recently had lost about 10 pounds in weight. He smoked only 4 cigarettes a day. He was treated at home with penicillin and his cough and discomfort over the sternum improved.

On examination, he was pale; his temperature was between 100° and 104°F; apart from a few crepitations scattered all over the chest, there was no abnormality on physical examination. He showed no clubbing of the fingers.

Investigations—Hb. 83 per cent, W.B.C. 17,300/c.mm. (polymorphs 73 per cent, lymphocytes 13 per cent, monocytes 3 per cent, eosinophils 9 per cent. Sputum examination was repeatedly negative for acid-fast bacilli and malignant cells; X-ray chest—clear.

A week later, he developed generalised rhonchi and the crepitations were more marked. In spite of penicillin for 8 days, his temperature continued swinging and W.B.C. count was 19,000 per c.mm. Oxytetracycline brought the temperature down for 3 days. The patient then developed, what was thought clinically to be, signs of an obstructive emphysema in the left lower lobe. X-ray chest after 13 days again did not show any obvious lesion. Bronchoscopy did not show any abnormality except that the medial wall of the left main bronchus bled easily. Further investigations of the sputum were negative, as was the culture of the urine. E.S.R. was 65 mm. in 1 hour (Westergren); blood cultures and W.R. were negative.

He complained of left-sided chest pain and was coughing up purulent sputum. A bronchogram and further chest x-ray did not show any changes. Total W.B.C. were still 19,000 per c.mm. and Hb. was 76 per cent. Serum proteins were normal and the urine did not contain Bence-Jones proteins.

Seven weeks after admission, he was noticed to be breathless and x-ray chest now showed elevation of the left diaphragm and retraction of the mediastinum to the left. A large hilar mass was also present on the same side. Tetracycline did not help to bring the temperature down. Other physicians and radiologists were of the

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opinion that the case was of bronchial carcinoma. He died 10 weeks after admission; necropsy was not done. In retrospective analysis, there was always a slight prominence of the left hilar area in the films of the chest.

Case 3—A woman, 58 years of age, was admitted as a case of fever due to chest infection. She had been treated at home with chloramphenicol for 5 days and had also had a short course of penicillin. There was a slight nonproductive cough. She had no pain in the abdomen and had always taken laxatives. A few days previously, she noticed a trace of bright blood in her stools, which she emphatically attributed to her piles, which were of long duration. She had not lost any weight.

On examination, she was obese; no abnormality was detected on physical examination. Rectal and vaginal examinations were negative.

Investigations—Hb. 86 per cent, R.B.C. 4 million/c.mm., W.B.C. 10,000/c.mm. (normal differential). Sputum, blood cultures, agglutination tests and x-ray chest were negative. Urine contained a few W.B.C.'s and showed a growth of *Esch. coli*. A course of sulpha combination was ineffective, but the temperature started subsiding spontaneously a few days later. She was discharged afebrile, but her E.S.R. was 68 mm. in 1 hour.

She was re-admitted three months later complaining of loose motions 3 to 4 times a day and she had noticed bright blood on several occasions. She again had a temperature between normal and 102°F. Sigmoidoscopy and barium enema both revealed a carcinoma at the rectosigmoidal junction which at laparotomy was inoperable.

Case 4—A woman, aged 50, was admitted for persistence of temperature. One month previously, she was treated at home for pneumonia with penicillin, chloramphenicol and aureomycin by her family doctor. She had a temperature of between normal and 103°F, but her general condition had remained very good all the time.

While she was in the hospital, apart from the pyrexia (Fig. 1), she had no other complaints. Her history and

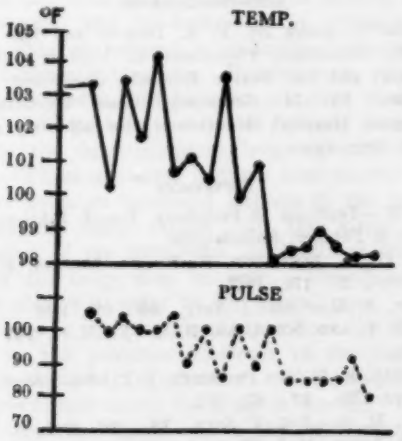

FIG. 1—SPONTANEOUS SUBSIDENCE OF TEMPERATURE IN CASE 4.

physical examination did not give any lead as to the nature of her disease.

Investigations—Hb. 72 per cent, W.B.C. 7,900/c.mm. (normal differential). Urine, sputum, Paul Bunnell, agglutination tests and x-ray chest were all negative. E.S.R. 53 mm. in the first hour (Westergren). Test for occult blood was weakly positive. A course of penicillin had no effect, but a few days later, her temperature subsided spontaneously. Vaginal examination did not show any abnormality, but at rectal examination, some bright blood was noticed on the examining finger.

She was discharged home for domestic reasons and at a later date sigmoidoscopy and barium enema showed a carcinoma of the rectosigmoidal junction. She had no pyrexia when she was re-admitted on the surgical side, but had occasionally passed three or four stools a day. There had been no blood in the stools while waiting at home. An abdominoperineal resection was performed; an ulcerative ring carcinoma was found, but the lymph glands were free from the growth. The microscopic examination showed a well differentiated adenocarcinoma. In the follow-up clinic after two months she had kept remarkably well.

Case 5—A man of 29, a fish packer by profession, was well until June 1954, when he developed an aching pain in the dorsal spine, pyrexia between normal and 103°F and profuse sweating. He had also lost a few pounds in weight. Apart from pallor, physical examination did not show any abnormality; there was no vertebral tenderness.

Investigations—Hb. 80 per cent, R.B.C. 3·6 million/c.mm., W.B.C. 11,100/c.mm. (normal differential), E.S.R. 108 mm. in one hour (Westergren). Paul Bunnell, agglutination tests and urine showed no abnormality. There were no Bence-Jones proteins. Blood cultures, leptospira agglutination test, brucellin test and Casoni test were negative. C.S.F. and liver function tests were normal. Mantoux 1 in 1000 was positive. X-rays of chest and spine and barium follow-through were negative. There was no evidence of subdiaphragmatic abscess.

A five-day course of aureomycin was without effect. Four weeks after admission, he still had pyrexia (Fig. 2),

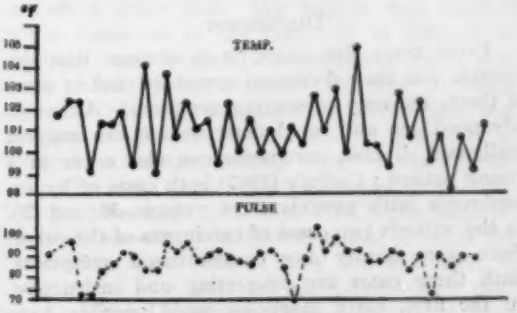

FIG. 2—THE TEMPERATURE PATTERN OF CASE 5.

his backache had improved, but he developed signs of collapse of the left lower lobe. Bronchoscopy was done and a good deal of mucopurulent discharge coming from the left main bronchus was noted. No neoplasm was visualised. A fortnight later, an effusion developed on the same side and a diagnostic tap produced 10 c.c. of

clear straw-coloured fluid which showed a moderate number of lymphocytes and a small number of polymorphs. Acid-fast bacilli were not seen and the culture was sterile. Repeated sputum examination was negative. A course of chloramphenicol was also ineffective. Streptomycin and isoniazid for several days, did not help to bring down the temperature.

In spite of three months' illness, his general condition remained satisfactory, but he looked very pale and complained of pain and stiffness in the back of the neck.

Further investigations showed: Hb. 72 per cent, R.B.C. 4·5 million/cmm., total W.B.C. 7,200/c.mm. (polymorphs 56 per cent, lymphocytes 36 per cent, monocytes 8 per cent). No L.E. cells were found in the peripheral blood.

Blood urea	... ...	26 mg./100 ml.
Serum calcium	... ...	10·8 mg./100 ml.
,, inorganic phosphorus		5·1 mg.%
,, alkaline phosphatase		21 K.A. units/100 ml.
,, albumen	... ...	3·5 g.
,, globulin	... ...	3·9 g.
,, ,, (α)	...	1·3 g.
,, ,, (β)	...	1·6 g.
,, ,, (γ)	...	1·0 g.

Cold agglutinin 1 in 4. Marrow was hypoplastic; granulocytes, a few normoblasts and lymphocytes were seen; no abnormal cells could be seen.

Five months after his admission, he had lost 2 stones in weight and still had pyrexia. His ribs, cervical spine and iliac crests were tender. X-rays now showed multiple small destructive areas in the skull, ribs, spine and pelvis; the left base was clear, but both lung fields showed small multiple opacities. The optic fundi showed agglutinations in the retinal veins following pressure. He died at home shortly afterwards. Post-mortem was not done.

The only possible diagnosis was that of multiple myelomatosis, though it could not be confirmed by the typical cells. The radiological appearance of the bones, high globulins and retinal appearance favoured this diagnosis.

Discussion

From these five cases, it is obvious that the pyrexia was their dominant symptom, and in some of them, the only presenting symptom. Although advanced age and rapid deterioration can suggest malignant disease, carcinoma can also occur in a young patient; Catlin's (1947) both cases of hypernephroma with pyrexia were young—36 and 20. In the writer's two cases of carcinoma of the colon, there were hardly any constitutional symptoms. Both these cases are interesting and instructive. In the first, early diagnosis could possibly have made operation feasible. 'He who seeks finds' is nowhere more applicable than in the second case. Rectal examination, in spite of subsidence of temperature, made the early diagnosis and the treatment possible.

Though leucocytosis can occur in various conditions giving rise to pyrexia, it is not well recognised that it can also be associated with malignant tumours and such cases may be treated initially for presumptive infective lesions. Cases 1 and 2 had leucocytosis and were treated with antibiotics for the same reason. Furthermore, in certain anaemias, especially iron deficiency, with leucocytosis for which there is no obvious cause, malignant disease has to be excluded. Horder (1952) mentions leucocytosis over 50,000 c.mm. in malignant diseases; leukaemoid reactions with higher figures have also been observed.

Various theories about the origin of pyrexia in malignant disease have already been mentioned above, but its clinical significance is uncertain; the fever may be suggestive of a rapidly growing tumour. Shackman and Daniel (1953), writing about renal tumours, think that pyrexia, in general, indicates poor prognosis and is often associated with extensive metastases in the lungs. In Cases 1, 2 and 5, the course was fatal in a short time; in Case 3, carcinoma was inoperable. It is too soon to judge the prognosis in Case 4. There has been no particular pattern of fever in these cases; in each, the pyrexia was quotidian intermittent or irregular. In those patients who had disproportionate rise of pulse rate, the lesions were rapidly fatal. No patient complained of rigor.

Summary

Five cases of malignant disease at various sites have been described. In all, their predominant symptom was pyrexia and in some it was the only symptom.

Acknowledgments

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PRACTITIONERS' SERIES

SURGICAL TREATMENT OF TUBERCULOSIS OF THE SPINE

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One cannot but be impressed with the magnitude of the problem of tuberculosis, and in particular with the problems it presents when it attacks the spine. There is a serious economic problem. The patients have a long period of disability, and have to take expensive medicines and injections for many months. The resultant deformities may not only be unsightly, but may affect the basic bodily functions such as respiratory reserve, and pregnancy and childbirth in women. There may be more serious immediate complications such as abscess and sinus formation, paralysis, tuberculosis of the meninges and lungs. For these reasons it would seem that whatever we can do to reduce the period of disability, minimise the degree of deformity, and hasten the complete healing of the tuberculous process, will be of great benefit to these patients and their families.

DIAGNOSIS

The diagnosis of the tuberculous process is not always easy, and the earlier in the course of the disease that we attempt to make the diagnosis the more difficult it becomes. Nevertheless, as much of our treatment will be more effective if started early, it is important to arrive at an early diagnosis. Usually the first symptom is pain, and muscle spasm. There are some patients that show a 'flat' back or even an increased lordosis in the lumbar area in the early stages. In the x-ray some narrowing of the interspace, or localised destruction of the body may be seen. The disease is almost always anterior to the neural canal. Only about once in four hundred times does the disease occur in the posterior elements of the vertebra without any body involvment. There is nothing so characteristic about the x-ray in the early stages of the disease. Later on, as the destruction becomes more pronounced and a kyphosis occurs, the differentiation becomes easier, but metastatic carcinoma can cause a collapse which appears very similar to that of tuberculosis. Because of the need for as certain and as early a diagnosis as possible, we should not be unduly hesitant about a direct attack upon the body of the vertebra for a biopsy. In some clinics this has become fairly common procedure (Johnson, 1953).

TREATMENT

Non-operative.—Once the diagnosis has been established we have much to offer in the way of non-operative treatment (ORHI 1954). First of all the patient is put on complete bed rest lying in some form of anterior and posterior plaster shells. This is an age old principle in the treatment of tuberculosis. In the days before antibiotics the usual period of time was from two to four years (Whitman, 1930). In 1951 Dobson reported on a large series in which the average time was thirty nine months for bed rest and hospital care. Since the advent of the antibiotics the length of time for bed rest and hospital care has been reduced (Wilkinson, 1954). The patient should have an adequate diet, especially of proteins and vitamins. Streptomycin=2—3 g. a week, along with 12 g. P.A.S. per day is very satisfactory. When I.N.A.H. is used it should be about 150 to 300 mg. per day. There seems to be no special virtue in using all three at one time. There is no doubt that good results can be obtained by the non-operative methods with an adequate period of rest and with anti-tuberculous drugs (Dobson, 1951 ; Stevenson, 1954 ; Wilkinson, 1954).

Surgical fusion—If the period of convalescence can be shortened without sacrificing in any way the good end results, we will have helped the patients a great deal. We believe that surgical fusion helps us to do that. It is difficult to adequately and properly immobilise a given area of the back by external means. But surgical fusion will establish early complete immobilisation, and therefore meets one of the basic requirements of tuberculosis therapy, namely "rest" of the affected part. Secondly, it provides permanent protection. A large percentage of adults even when immobilised will show only a fibrous union between the diseased vertebrae and if they are subjected to undue stress at a later period, a breakdown may occur and the disease may be re-activated. A bone fusion is a protection against this. Spine fusions have been done for tuberculosis and since 1940 a cure rate of 88 per cent has been obtained. Only about one half of these patients had any anti-tuberculous drug. This compares very favourably with those using the non-operative method only, and the average period of disability has been less.

Complications

There are two complications:

Abscess formation—The abscess may be paravertebral, or it may point more superficially in the groin, or posteriorly, or along one of the ribs. With the use of the antibiotics it is often possible to do a surgical evacuation and to close the skin primarily with no subsequent sinus formation.

When a paravertebral abscess persists it should be surgically attacked and relieved. Pus under tension has a very deleterious effect upon bone. It is one of the causes of spread of the disease from vertebra to vertebra.

Cord compression—It is the second and more serious complication. The first symptoms are usually pain in the legs, weakness and paraesthesias. One of the early consistent signs is ankle clonus. Some feel that fusion should be done first as the increased stability will cause improvement in some patients (Bosworth *et al*, 1953). If they do not improve, an anterior transplantation of the cord can be done (Mukopadhya, 1954 ; Svien, 1954). If the compression is from pus only, a transversectomy or costotransversectomy will suffice. If the anterior aspect of the gibbus that lies under the cord is removed so that the cord can fall forward, a very satisfactory decompression may be obtained. The fusion that has already been done holds the vertebrae securely even though the pedicles on one side have been removed. Generally the results seem better from this operation than from a laminectomy which decompresses the cord posteriorly but leaves it stretched over the gibbus anteriorly (Mukopadhya 1954 ; Ramamurthi and Thayumanswami 1954 ; Svien 1954).

Results

In the past two and a half years we have seen 85 cases of tuberculosis of the spine. There has been nothing unusual about the distribution except there having been more males (50) than females (35). The location of the disease was as follows: 2·2 per cent cervical, 40 per cent thoracic, 8·8 per cent thoracolumbar, 44·4 per cent lumbar and 4·4 per cent lumbosacral. Five patients had two foci, making a total number of 90 foci of disease. Sixty accepted fusion. The rest either refused or it was felt unnecessary because of their age, or the status of the disease. The first few were difficult from the anaesthetic point of view. The prone position is difficult for the anesthetist, and it was not until we started using the endotracheal technique that the operations became smooth. There have been no deaths to date, in the fused group. Of the sixty only the first forty will be used for this study as the others have been so recent that we do not want to include them in the evaluation of our results. However, to date their progress has been satisfactory.

In a group of forty the average follow-up time is ten months. There is one failure due to persistent paravertebral abscess. One has a pseudoarthrosis at the lumbosacral junction. Five have not kept in touch with us. These five were doing nicely at the time they left. The remaining 35 kept in touch with us at least until they went back to work, and some much longer than that. The average period of disability from the time of operation to the return to work in this group was about nine months. This is about one half the period of disability which can be expected with the nonoperative treatment, where one must count on a year of bed rest and three to six months of restricted activity before regular work is resumed.

Summary

We feel that the use of spinal fusion is a definite and important step in the over-all treatment of tuberculosis of the vertebrae. In a series of sixty such operations there have been no deaths and no serious complications and the period of disability has been reduced to an average of nine months.

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SPECIAL ARTICLE

BRUCELLOSIS : POSSIBILITY OF ITS OCCURRENCE IN RAJASTHAN †

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Brucellosis is at present considered a rare disease in the country. The fact, however, is that it is not so rare but is most often missed. Its incidence in Southern Punjab which borders Rajasthan is 14 per cent among all cases of P.U.O. (pyrexia of unknown origin) examined serologically, 70 per cent of which turns out to be typhoid fever and another 16 per cent typhus fevers. On the South West of Rajasthan brucellosis has been reported from Gujarat and Saurashtra (Shah, 1954). It will be interesting to know its incidence in Rajasthan.

Consciousness about the disease in India came from the discoveries that were made about it in the first decade of the present and last decade of the 19th century. Thereafter, the enthusiasm about the disease in India dwindled to such an extent that the disease is now considered to be very rare. The diagnosis is missed in about 85 per cent of the cases. In 15 per cent of the cases where it is made it is very late even when these cases are typical.

Most of us do not remember the teaching of Osler, namely, "If all fevers of undetermined origin are considered as probably due to brucella infection and agglutination tests are carried out the diagnosis is rarely difficult". I may cite the case of a patient suffering from ascites who had an undulant like temperature in whom the disease was suspected because of the fever and confirmed serologically (Mathur, 1955 a). It should be suspected in all cases having fever where a definite diagnosis has not been made.

Occupation and brucellosis—Brucellosis consciousness at present is so low that the disease is not suspected even among people who are exposed to its hazards. They are (1) butchers and slaughter house workers ; (2) people dealing in hides and skins ; (3) boys who take out sheep, goats and cattle for grazing ; (4) farmers and agricultural workers ; (5) dairy workers ; (6) veterinarians and (7) bacteriologists handling cultures of the organisms.

It is more a disease of rural areas because people living in such areas come more intimately in contact with infected cattle, sheep and goats. It is of immense importance to our rural medical officers (Mathur, 1953).

Role of animals—There are certain misconceptions about the source and mode of infection. Some physicians believe that the disease affects only goats and sheep. They do not know that cows, buffaloes, horses, camels and pigs also suffer from the disease and man can acquire infection from them also.

Sources of infection—Very often patients will deny history of taking unboiled milk. But they will admit drinking *lassi* made from such milk in the summer, or having eaten cream which is as a rule obtained from unboiled milk. This cream enters in the preparation of ice cream, fruit cream, pastries etc. In the Punjab there is a dangerous practice of drinking milk from a *'dhar'* (turning of the stream of milk while milking an animal direct to the mouth of a person instead of allowing it to fall in a vessel). At present the physician is too readily satisfied with the patient's history of not taking unboiled milk. These other methods are not thought of.

Contacts—Very often when a patient has denied the history of taking unboiled milk, the physician has not thought of contact with infected cattle sheep and goats. This source accounts for 75 per cent of infections. Only 25 per cent is accounted for through ingestion of unboiled milk (Spink, 1952).

Appreciation of the disease in animals—Our lesser appreciation of the disease in humans is due to our lesser appreciation of the disease in the animals. It is not known to many of us that it causes the birth of dead macerated calves, retained placenta and abortions among the cows. It also causes mastitis and low milk yield among them or may cause synovitis. Among sheep and goats it may be the cause of abortions or infertility. Many such animals find their way to the slaughter houses. Among horses it causes chronic sinuses of the ligamentum nuchae (fistulous withers) and poll evil and we hardly ever question our patients of P.U.O. if they have been in contact with such animals. Harris (1950) has reported brucellosis among two children who had contact with a horse with fistulous withers. A *tonga* driver who keeps such a horse or a person who has tried to take out a retained placenta from a cow may get infected. Camels also suffer from the disease (Zaki, quoted by Kaplan, 1950) so it is possible it might be occurring in Rajasthan where all these animals are kept. The type of infection that prevails in the Punjab is mainly *Br. melitensis*. Cross infection of cows, buffaloes and possibly camels from goats from common pastures is a possibility. Does a

† Paper read at the 32nd All-India Medical Conference at Jaipur.

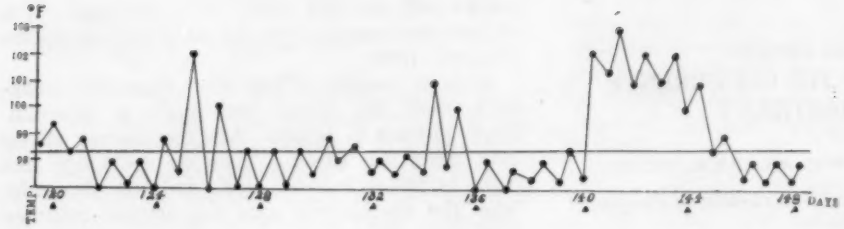

FIG. 1
UNDULANT FEVER-LIKE TEMPERATURE.
(S. L., 40 years, Male).

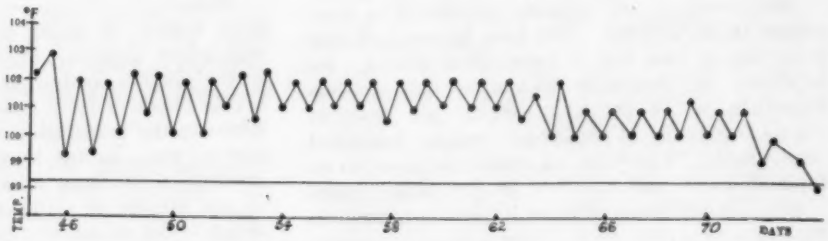

FIG. 2
TYPHOID-LIKE TEMPERATURE.
(P., 12 years, Female).

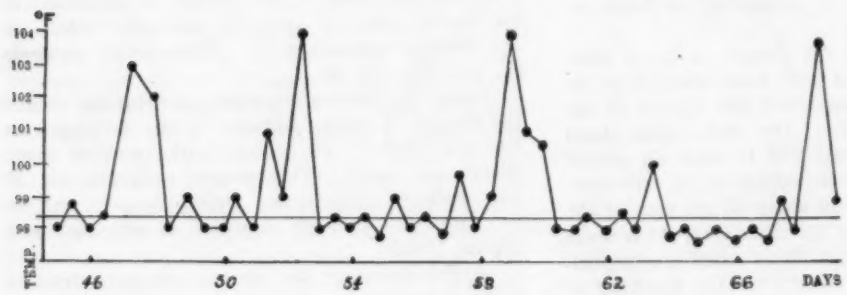

FIG. 3
RELAPSING FEVER-LIKE TEMPERATURE.
(S., 6 years, Female).

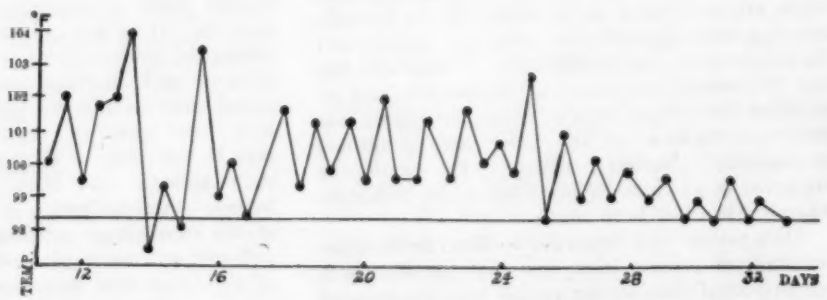

FIG. 4
IRREGULAR TEMPERATURE.
(D. K., 18 years, Male).

similar situation exist in Rajasthan? The goat and sheep population in this state are not less than in the Punjab. The incidence of serological reactors in slaughter house goats and sheep in Karnal (Punjab) is round about 7 per cent (Mathur, 1953).

The incidence of the disease in humans depends upon its incidence in cattle, sheep and goats, pigs, horses and camels.

Types of temperature—Although the undulant type of temperature (Fig. 1) is very typical of brucellosis, all types of temperature may be met with, e.g., typhoid-like (Fig. 2), malaria-like, relapsing fever-like (Fig. 3) and irregular (Fig. 4), A physician who relies only upon an undulant fever like temperature chart for the diagnosis of the disease will therefore miss it in many cases; at any rate he will be able to diagnose the disease only after several waves of fever and therefore very late.

Signs and laboratory investigations—The signs in the disease are so few that the disease can only be diagnosed after serological and cultural

tests are done in the laboratory. Very few physicians suspect the disease. Fewer still use the laboratory, so the disease remains rare.

The diagnostic titre—It is a wrong belief that only very high titres are diagnostic. With Kasauli antigen a titre of 1 in 125 to 1 in 250 should be considered diagnostic (Mathur, 1955b).

With some antigens about 30 per cent of the cases are missed. (Mathur, 1955b). With the Weybridge antigen only about 1 per cent of the cases is missed. Some antigens although less specific are more sensitive, i.e., although they detect less cases they give higher titres than the more specific ones.

If a full range of dilutions is not put up then positive sera are missed due to the prozone phenomenon. Further dilutions than 1 in 125 should always be put up.

Generally for cases of fever the dextrose broth or media that support the growth of typhoid or paratyphoid bacilli are used. Brucella seldom grow in these media. Very few laboratories use the *Albimi* or the *Trypticase soy* media for cultural purposes. Very few physicians and very few laboratories proceed straight to employ culture for brucella in all their cases of P.U.O. as they do for typhoid, and very few physicians ask for it in their cases of P.U.O. after culture for typhoid is negative. It must also be admited that not many bacteriologists are prepared to undertake culture for brucella or to go into some tedious processes. The early administration of antibiotics of the tetracycline group and chloramphenicol indiscriminately to cases of P.U.O. adds to the difficulties, of the already not too enthusiastic bacteriologist.

Summary

There is a possibility of the occurrence of brucellosis in Rajasthan, and its incidence will be no less than in the surrounding areas of Punjab, Saurashtra and Gujarat. It should be suspected in people exposed to its hazards. Its incidence is greater in rural areas, and the disease is of greater importance to our rural medical officers. That cows, buffaloes, horses, camels, and pigs besides goats and sheep also suffer from the disease must be remembered. Unboiled milk, and milk products of these animals are a source of infection. Contact with these animals is, however, a greater source of infection than drinking their raw milk. There is also a need for greater *zoonosis* consciousness. The disease is missed because it is not suspected and the aid of the laboratory is not taken. The disease is missed for malaria, influenza, paratyphoid, typhoid, rheumatic fever, rheumatism, tuberculosis, lymphocytosis and infectious mononucleosis in children. Sciatica, branchial neuritis and orchitis are seldom attributed to brucellosis. There is need for reorientation of thinking with regard to the diagnostic titre. Above all there is need that laboratories should subject sera received for Widal to the agglutination test for brucellosis.† The disease will then I am sure not remain so rare.

Acknowledgments

I am thankful to Dr. J. C. Patel, Editor, *Indian Journal of Medical Sciences*, for having permitted me to reproduce one of the temperature charts published in his Journal of February, 1956.

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† It is not practical. Request for special test must come from physicians—Ed., *J. Indian M. A.*

CASE NOTES

NEUROPARALYTIC ACCIDENT FOLLOWING ANTIRABIC VACCINE TREATMENT

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AND

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The nervous complications following prophylactic vaccine treatment of rabies is rare. Its incidence is said to vary from about 1 in 1,000 to 1 in 4,000 (Brain, 1948). This is lowest when carbolized vaccine is used. It is more common in males than in females and in adults than in children. The nervous complications usually appear some time after the eighth injections and uptil two months after the completion of vaccine treatment.

Clinically three forms of neuroparalytic accident following antirabic inoculations have been described. They are : (1) An acute ascending paralysis similar to paralytic form of rabies. (2) Transverse myelitis usually of the dorsal lumbar regions. (3) Multiple neuritis involving the various peripheral and cranial nerves.

In the Indian literature a limited number of cases of nervous complications following antirabic vaccines has been reported. Dang (1942) reported a case of lumbo-dorsal myelitis occurring 10 days after commencement of injections. The patient had only 6 injections of the vaccine and he ultimately recovered completely. Dwivedi (1949) reported a case of urinary bladder paralysis appearing a day after 11th injection of the vaccine in 13 days. This case also recovered completely. Banerjea and Maiti (1954) reported two cases of ascending paralysis following the antirabic vaccine treatment. In their first case it started with weakness of limbs, high fever and headache after the 11th daily injection of the vaccine. On the following day there was retention of urine and soon there was marked weakness of all the limbs. Two months after the onset of nervous complications, he was found to have improved considerably. The second case started with weakness of lower limbs, fever, headache and retention of urine about 3 weeks after the fourteenth injection of the vaccine. The patient died about a month after the onset of the neuroparalytic accident. Konar *et al* (1955) recorded two cases of ascending paralysis following antirabic vaccine treatment. The first case developed slight fever, nausea etc. during the period of eight daily injections of the vaccine. Four days later she developed weakness of limbs, retention of urine, paralysis of oculomotor nerves etc. Two months later the condition of the patient was found much improved. In the second case the nervous complication developed after the 11th injection. It started with high fever, generalised muscular pain, retention of urine followed by weakness of limbs in two days. About two months later the condition of the patient was found to have improved. These two patients were treated with A.C.T.H. Bhattacharyya (1955) reported a case of nervous complication developing after antirabic vaccine treatment. It started insidiously on the 8th day of daily vaccine injection. In the course of a few days the patient developed flaccid paralysis of lower limbs and weakness of external rectus muscles of eyes. Three and half months later the patient was found to have improved considerably.

A case of neuroparalytic accident following antirabic vaccine treatment came under the observation of the authors. The case is reported below.

Case Report

S. G., 36 years, male, Hindu, tall and robust, milkman by occupation, was admitted in Sanctoria Hospital at noon on 6-10-55 for slight fever with headache and generalised pain all over the body for 3 days and retention of urine for 24 hours.

There was history of the patient being bitten by a rabid dog on 7-9-55 on his left big toe and adjoining part of the foot where three punctured wounds were caused by the bite. He had fourteen daily injections of 5 c.c. of the antirabic vaccine commencing from 10-9-55. The vaccine contained 5 per cent of the sheep brain infected with Paris virus and its suspension made in a lotion of about 0·5 per cent phenol in distilled water.

On examination—Oral temperature—101·4°F. Tongue dry and slightly coated. P/R—90/20 per minute. B.P.—130/40 mm. Hg. Urinary bladder —distended up to the level of umbilicus for which the patient was complaining of pain. There was no neck rigidity. The mind was clear.

Laboratory investigation—Hb. 60 per cent (Sahli) ; W.B.C. 9,400 per c.mm. with polymorphs 80 per cent, lymphocytes 18 per cent, eosinophils 2 per cent. Urine and stool had no abnormality.

Retention of bladder was relieved by a soft catheter and as he was unable to pass water a Foley's catheter was kept in. The patient had constipation which was relieved by enema. Sulphadiazine tablets 1 g. four times a day and an alkali mixture with tinct. hyoscyamus were prescribed. Later on he also had penicillin sodium 2,00,000 units I.M. every 4 hours and 1 g. of streptomycin I.M. twice daily.

The condition of the patient practically remained same for 3 days with temperature varying between 101° to 103° F. On the morning of 9-10-55 the patient suddenly developed complete paraplegia of lower limbs with knee and ankle reflexes completely lost. Plantar and abdominal reflexes showed no response. The consciousness of the patient was not affected. The eyes were congested, and the pupils were small reacting sluggishly to light. Weakness of rectus lateralis of both eyes was present. There was also some weakness of the palate and pharynx with regurgitation. Neck rigidity was detected. The temperature went up to 104°F. Hb. 58 per cent ; W.B.C. 12,500 per c.mm. with polymorphs 88 per cent ; lymphocytes 10 per cent ; myelocytes 2 per cent.

On lumbar puncture, the pressure of C.S.F. was found to be moderately increased. Fluid was slightly hazy and a cobweb was formed in a few hours. Microscopic examination : W.B.C. 118 per c.mm. with polymorphs 62 per cent, lymphocytes 35 per cent, monocytes 3 per cent. There were few red cells. Biochemical : Sugar 40 mg., proteins 160 mg. and chloride 622 mg. per cent. Nonne-Apelt phase 1—positive. Smear including the cobweb revealed no acid-fast bacilli. W.R. and Kahn tests were negative.

The condition of patient progressively got worse. The patient developed flaccid paralysis of the upper limbs without sensory loss. The patient became semi-conscious. Pupils were pin point with no reaction to light. There was complete paralysis of the oculomotor nerves.

Later the patient became comatose and respiration was laboured with bubbling rales in both the lungs. He expired by midnight from failure of

Irgapyrin

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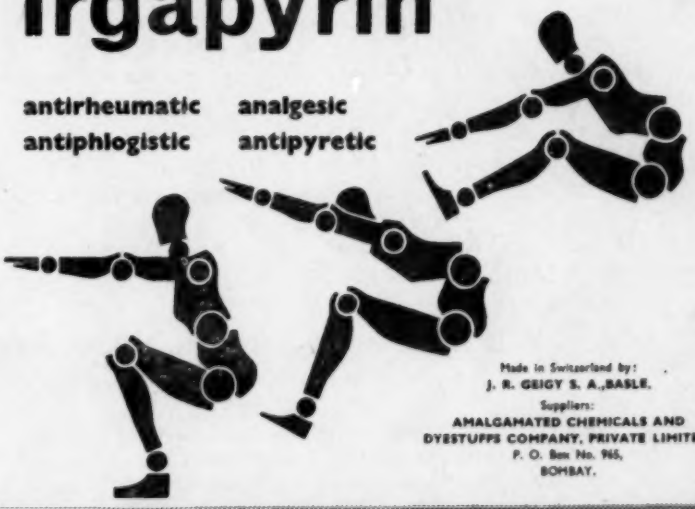
antiphlogistic antipyretic



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medullary centres and oedema of lungs. Post mortem examination was not allowed.

Discussion

The clinical picture of an acute fulminating type of ascending paralysis developing 10 days after the conclusion of a course of antirabic inoculation suggests the possible diagnosis of a neuroparalytic accident following the vaccine. It was however well nigh impossible to differentiate the disease from the paralytic form of rabies. Such difficulties in differentiating the two diseases clinically will arise whenever one is bitten by a rabid animal and having taken antirabic inoculations develops the syndrome of ascending paralysis and ends fatally in course of a few days. In this particular case the diagnosis was made in favour of neuroparalytic accident on the following grounds :

(1) A course of 14 daily injections of 5 c.c. of the vaccine was considered sufficient to prevent rabies in this particular case taking into account the severity of bite and other factors. The restrictions during the vaccine treatment period, i.e., no alcoholic drink and no heavy physical exercise were strictly followed.

(2) Though the incubation period of rabies is widely variable an incubation period of 26 days may appear somewhat short considering that the site of bite was the left big toe and the adjoining part of the foot.

(3) Clinically the common symptoms of rabies such as pharyngeal spasms, hydrophobia, psychic disorders, photophobia, etc. were completely absent. In the paralytic form of rabies however the effects of cerebral irritation may be completely absent. But paralytic rabies rarely seen in the canine-transmitted rabies in man were to be commonly seen in the bat-transmitted variety at Trinidad.

(4) The changes noted in the C.S.F. in this particular case may possibly go in favour of neuroparalytic accident following antirabic inoculation.

Summary

A case of fulminating type of ascending paralysis following antirabic inoculations has been described. The Indian literature about the subject has been reviewed.

Certain changes in the C.S.F. were noted towards the end.

Acknowledgment

I wish to convey my thanks to Dr. S. K. Banerjee, Assistant Professor of Pathology, Medical College, Calcutta, for the detailed examination of C.S. fluid.

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CONJOINED TWINS IN A CASE OF TRIPLETS

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A 9th gravida was admitted into the Female Hospital, Datia on 22-8-55 at 6-30 P.M. for confinement with the following history :

(1) Amenorrhoea for 28 weeks ; (2) undue enlargement of the abdomen, (3) great difficulty in moving about and difficulty in breathing and (4) slight pain.

Her obstetrical history was as follows : She had altogether eight children of whom three were alive. Of the three living children the first child, who was 18 years old, was mentally defective. The second child aged 7 years and the third child aged 4 years were healthy.

The other five children died of illness of various nature, between ages 1 year and 2¼ years.

All the confinements were normal home confinements.

On examination the patient was found to be moderately anaemic, the temperature was 98°F., the pulse rate was 90 per minute, blood pressure was 120/70 mm. of Hg. There was no jaundice or oedema. Heart and lungs were normal.

The abdomen was abnormally big and tense. The foetal movements were not felt and foetal heart sounds were inaudible.

A P.V. examination revealed that the cervix was two fingers tight and the membranes were intact.

On rupturing the membranes artificially, moderate amount of liquor amnii came out and a premature head was felt floating.

The case was diagnosed as twins with hydramnios. A soap water enema was given. The

patient was having sluggish uterine contractions and the first premature male child was born at 12-10 A.M. on 23-8-55, with a vertex presentation.

Subsequently the membranes of the second child were also ruptured artificially. A great amount of liquor amnii gushed out and the second baby was delivered with vertex presentation at 12-20 A.M. The placenta was out normally and it was a uniovular one.

The first baby weighed 1½ lbs. only and survived for 1½ days. The second conjoined twin had only heart beat, no cord pulsation and it could not breathe inspite of the resuscitation measures adopted. It weighed 2½ lbs.

DESCRIPTION OF THE CONJOINED TWIN—It was a male (both) conjoined twin. There was only one common trunk, a single head and 1 face with 1 nose and a pair of ears and eyes. There was one mouth and one neck, four hands and legs. There were two male genital organs. Each leg had five toes and each palm had five fingers each. The scalp had growth of hair over it. The skull was broadened posteriorly and there was a growth at its midposterior region (Figs. 1 and 2, *vide* Plate). Post-mortem examination could not be done.

ACKNOWLEDGMENT

I am thankful to Dr. S. C. Sen for allowing me to publish the case note.

CLINICAL EXPERIENCES WITH PHENYLMETHYL AMINE-P-AMINOBENZENE SULPHONATE ON LEPRA REACTION

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The previous brief investigation (Love and Waddel, 1925, Masakzu and Tohaku, 1925) on the physiological properties of phenylmethyl amine and its antispasmodic property impressed Chatterjee and Maitra (unpublished work) to work out in detail the physiological properties of this primary sympathomimetic amine.

It has also been found that it exerts a bacteriostatic action on tubercle bacilli (Chatterjee). This drug was therefore tried in cases of neural leprosy and lepra reaction.

In a series of cases where phenylmethyl amine hydrochloride was tried the rate of improvement in the clinical condition was very slow and did not favourably compare with the sulphone which by that time became established. Later as the limitations of sulphones began to be apparent and specially as it proved less effective in neural varieties and even dangerous in lepra reactions phenylmethyl amine was started again.

In the search for newer chemical compounds of phenylmethyl amine stable both in chemical and physiological properties it was possible to make a new compound with p-aminobenzene sulphonic acid. This new compound, phenylmethyl amine-p-aminobenzene sulphonate was subjected to clinical trials.

The drug was given by intramuscular injections, on alternate days. The dose of each injection was 0·05 g.

Case 1—A.H., 30 M.M., an old tuberculoid case, with anaesthetic area on the right thigh of 4 inch diameter, showed lepra reaction. The lobules of the ears and alae nasi were swollen. The man was suffering from leprosy for five years and had previously injections of hydnocarpus oil and sulphetrone. Although the patient improved considerably, he was not completely cured as he never got a stable treatment. As he became sensitive both to hydnocarpus oil and sulphone due to his irregular treatment he was put on to injections of phenylmethyl amine-p-aminobenzene sulphonate. The result was impressive. Swelling of the ear lobules came down after third injection and lepra reaction completely subsided by 18 injections, anaesthesia improved gradually and after 30 injections (total dose 1·5 g.) it was present though in a very mild form. His diet was restricted, fats and oils were cut down to the minimum. He was encouraged to drink a large amount of fluid in the form of juices of citrus fruits. Scrapings for leprosy bacilli were negative before starting the treatment.

Case 2—N.M., 16 H.F., was a case of lepra reaction. She had swollen erythematous patches on all over the arms, forearms, trunk, and face, for about a year. Previously a year back she had swelling of the cheeks and big urticarial patches all over the body which were treated with vitamin B-complex, calcium, vitamin C and antihistaminics and she got a temporary cure. She was put on to phenylmethyl amine-p-aminobenzene sulphonate, after having 10 days' treatment with hydrocortisone —10 mg. t.d.s. She became gradually better which was very marked after 10 injections (total dose 1·8 g.). After 36 injections, the treatment was stopped for about two months. There was no swelling except for a fine erythematous tinge on both cheeks. The result with hydrocortisone was not appreciable before these injections were started. The scrapings for leprosy bacilli were negative before the treatment was started.

Case 3—T., 20 H.F., had lepra reaction on face. Her both cheeks, and ears were swollen and red. She had no previous treatment for the original anaesthetic patch on the back of the neck. After a course of phenylmethyl amine-p-amino-

benzene sulphonate injection (total dose 1·5 g.) there was no swelling, the redness had much subsided and sensation was slowly coming back in the neck. Scrapings for leprosy bacilli were negative before the treatment was started.

Case 4—H.I., 50 H.M., had been suffering from leprosy for long time and had treatments for 2 to 3 months at a time in many big cities of India. He was put on to sulphones a few years back which he could not tolerate and severe lepra reaction broke out all over the body. Six months back, there were several patches of various shapes and sizes all over the body, which were red and swollen. Scraping for leprosy bacilli were negative although it was positive many years back in the original patch. The patient was put on a course of vitamin B_{12} 500 mg. twice weekly, alkali, vitamin C and calcium. Phenylmethyl amine-p-aminobenzene sulphonate was started and there was marked clinical improvement after 5 injections. After 30 injections (total dose 1·4 g) the patient lost the reddish colour in the patches and swelling totaliy disappeared and sensation vastly improved. He is still carrying on with the treatment.

Case 5—I.M., 18 H.M., with lepra reaction had a swollen and tender right cervical cutaneous nerve. The lobules of the ears were also swollen and red, more so on the right side. There was marked anaesthesia over the entire dorsal side of the middle of the right arm to the middle of the right forearm. He was diagnosed as a case of leprosy about a year back and was put on to a course of thiosemicarbazone. He did not improve and broke down into the present condition of lepra reaction. Stool examination showed vegetative form of amoebae and emetine hydrochloride was given along with liver extract and with vitamin B-complex (about 20 c.c.). After this treatment with one injection of hydnocarpus oil on the dorsum of the right arm, he again showed a marked flaring up of the swelling and tenderness of the cutaneous nerve of the right side of the neck. This reaction was controlled temporarily with rest, calcium, and antihistaminics. As neither sulphone nor oil could be pushed, phenylmethyl amine-p-aminobenzene sulphonate was tried. After 4 injections he began to show clinical improvement which was very marked after the 10th injection (total dose 0·5 g.) specially with regard to the sensation. Unfortunately he had irregular treatment. The improvement in sensation was gradually lost although the swelling of the nerve and the ear lobule did not recur.

Case 6—S.C., 16 H.F., had anaesthetic patches over the dorsum of the right elbow and lepromatous patches all over the body. The alae nasi and the patches on the face were swollen. The original patches were noticed about two years back. The lepra reaction was of 8 weeks' duration and she had been treating herself very irregularly. Encouraged by good response of Case 1, phenylmethyl amine-p-aminobenzene sulphonate was given a trial along with general treatment of rest, good food, liver extract with vitamin B-complex and vitamin B_{12}. After 3 to 4 injections the swelling diminished and after 18 injections (total dose 0·9 g.) the sensation improved.

Case 7—A.K., 22 H.M., had anaesthetic patch over the left cheek of five years' duration. He had been treated by several doctors with hydnocarpus oil and sulphone had also been irregularly tried. The patient came with a swollen and tender cutaneous nerve on the left side of neck, and was treated for about a year, which was discontinued before getting completely cured. He came back again with the swollen nerve and swelling of the left ear lobule. After 8 injections of phenylmethyl amine-p-aminobenzene sulphonate (total 0·4 g.) the swelling subsided, the pain became less and the sensation came back gradually.

Conclusion

It will be evident from the present case reports that phenylmethyl amine-p-aminobenzene sulphonate is proving to be an effective drug for lepra reaction. Usually its effect begins from 3rd to 4th injection and the lepra reaction is controlled by 18 injections.

Acknowledgments

I must thank Mr. Gouri Sankar Chatterjee for preparing and selecting this chemical compound for clinical trial. Thanks are also due to Messrs. Alkaloid Research Laboratories Ltd., Calcutta, for supplying me 'Sulfomin' brand of phenylmethyl amine-p-aminobenzene sulphonate for clinical trial.

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No control cases undergoing treatment with other anti-allergic and antitoxic drugs which are very effective for the treatment of lepra reaction, such as antimony, glucose, streptomycin, anti-histaminic drugs etc., have been cited. The same case treated with different drugs one after another cannot serve as a reliable control. Effects of a drug are sometimes not followed immediately after its administration, e.g., a case treated with hydrocortone for ten days has been treated with sulfomin soon after the course of hydrocortone. Lepra reaction is such that many cases have spontaneous recovery. The standard treatment by potassium antimony tartrate, calcium and glucose has given excellent results in the hands of many. Ed.—*J. Indian M. A.*

JOURNAL OF THE
INDIAN MEDICAL ASSOCIATION

CALCUTTA, APRIL 16, 1956

IMPORTANCE OF SEROLOGICAL METHODS AS AIDS TO DIAGNOSIS OF INFECTIVE FEVERS

Among the infective fevers, there are many which can hardly ever be diagnosed without recourse to bacteriology. For instance, diagnosis of enteric fevers, typhus group of fevers, or brucellosis can hardly ever be made without either finding the respective causative organisms in the blood of the patient or by producing indirect evidence of such infection in the shape of measuring the quantity of specific agglutinins or other varieties of antibodies developed in the patient due to the infection. Without such evidence, the clinical diagnosis in many cases would prove to be futile.

Brucellosis is one such infective fever which can be diagnosed chiefly by serological methods. Clinically it seems to be of such protean nature[1] that it can be mistaken for any conceivable variety of infective fevers. It is only through routine brucella agglutination test of the serum of such patient that the exact nature of infection may be indicated. In case of brucellosis, isolation of the causative organism from the blood of the patient is hardly ever feasible due to its chronic nature. Hence the alternative to direct bacteriological diagnosis of brucellosis, is the serological method, which is the brucella agglutination test.

The interpretation of brucella agglutination test would have been easier, if the normal titre of the population at risk were determined before hand. As now it seems that brucellosis is prevalent in this country[2, 3], the importance of determination of such normal agglutinin titres would require to be especially emphasised. For it has been the experience of the past that a titre of even 1 in 100, in persons whose occupational habits expose them to risks of infection, is too low to be of diagnostic significance.

An additional difficulty arises out of total failure of development of agglutinins in many patients, especially those in whom pyrexia has lasted several months. Hence the absence of agglutinins would not necessarily exclude brucellosis.

Preparation of standard suspension of the agglutinating organisms is also technically more difficult than preparation of suspensions of enteric group of organisms, or the proteus strains. Brucella group of organisms are notorious for causing infection of laboratory workers who handle the living organisms. Hence, killed suspensions must always be used. And it is this method of killing which determines in a large measure the success or failure of the brucella agglutination tests. It would thus appear that unless a central organisation takes up the task of preparation and large scale supply of the standard brucella antigens in this country, diagnosis of many of the so-called P.U.O.'s would not be possible.

[1] MATHUR, T. N.—*Indian M. Gaz.*, **89**: 292, 1954.
[2] *Idem—Indian J. M. Sc.*, **9**: 57, 1955.
[3] *Idem—J. Indian M. A.*, **25**: 429, 1955.

MEDICAL MEN AND PHARMACISTS

Our editorial "Pharmaceutical Enquiry Committee and Medical Men" published in the July 1, 1955 issue of this Journal, appears to have irritated the *Indian Pharmacist*, as evidenced from its editorial, "Medical Men Again" (July 1955). We had overlooked it, to which our attention was recently drawn. Hence the delay in this rejoinder.

In our editorial, the recommendations of the Pharmaceutical Enquiry Committee were discussed by us, in respect of certain changes suggested by the Committee in the administrative setup of the Drugs Control Department.

To repeat what we said, the Committee was of opinion that "to ensure a more efficient administration of the Drugs Act," the posts of Drugs Controller, Assistant Drugs Controllers should be reserved for persons with "a degree in pharmaceutical chemistry or pharmacy or an honours or postgraduate degree in chemistry".

The administration of drugs control as we pointed out, constitutes two major functions: one, to enforce the policy of the government regarding manufacture, sales and import of drugs; and the other to control the quality of the drugs and to evaluate them properly.

Regarding the enforcement of government policy in such matters, our opinion is that technical qualifications are not at all essential. In technical matters, of course, the services of qualified chemists or pharmacists would, certainly, be useful.

But as we said in the editorial in question, we do not understand why a medical man who is thoroughly trained in materia medica, pharmacology, microbiology and therapeutics will not be suited for the posts referred to above. In drugs control, a thorough knowledge of therapeutics is desirable. So in the control of drugs, the clinician is the most indispensable person to give an opinion and regulate the import and sales of drugs. So our suggestion was that medical men with administrative abilities should be at the helm of the administration of the Drugs Act.

We are concerned with efficient administration of the Drugs Act and not with any desire to acquire some appointments for medical men. We still believe that persons with technical qualifications only, should not be allowed to hold key positions at the top. We do not believe that administrative ability vests in a person automatically with the acquisition of technical qualifications, as evidently the *Indian Pharmacist* presumes.

Moreover, we are opposed on principle to reservation of appointments for any particular group. Reservation smacks of inferiority of the persons for whom it is meant. We trust the *Indian Pharmacist's* ire does not stem from this complex.

Attention to self-interest is the specific order of the day. But persons who look too much to their own interests become blind to the just claims of others. This has happened with the *Indian Pharmacist* and it rushed to publish a rejoinder to our editorial. Let us now examine how far it has succeeded in refuting our arguments.

In the editorial of July 1955, the *Indian Pharmacist* traversed far and wide, evading the points we raised. At the outset, it referred to the Drugs Control in Bombay and said that it was incomparably efficient. It argued that this efficiency was due to the Drugs Controller of Bombay who is a pharmacist. In our editorial we did not particularise instances of success or failure of Drugs Controllers. A particular pharmacist may prove highly efficient. But special merit has not been monopolised by all pharmacists. The editorial then referred to pharmaceutical education and how it was introduced through the efforts of a non-medical man, at Banaras University. Would we fail to accord our appreciation of such efforts to introduce higher education in any subject in India? The *Indian Pharmacist* has also challenged the medical men to answer questions on pharmacy and allied sciences as given in the Pharmaceutical Survey of the United States. It has also referred to the standard of questions set at Jalpaiguri centre on pharmacy by certain medical persons. The *Indian Pharmacist* did not like "to go into details of the various points raised in our editorial" but was pleased to discuss all manner of subjects not relevant to the points we made. The reason perhaps is that our contention was quite fair, being not at all based on malice or rivalry. We would have been glad if the *Indian Pharmacist* showed us where we erred in our arguments.

Lastly the *Indian Pharmacist*, displaying an air of superiority wanted to refrain from discussing personal affairs. But it concluded by saying: "Let the medical men set their house in order and equip themselves scientifically". This is really childish. By making such statements, we think, *Indian Pharmacist* has damaged its own case because such statements show how childish and immature some pharmacists are.

We stand for fair play and no favour. As we have said before, we are opposed to reservations. Reservation smacks of inferiority of the class for whom it is meant. Let the posts under the Drugs Control Act be open to all qualified persons. The medical men do not want to have these posts as a matter of favour and they are also not afraid of competition.

THE CENTRAL COUNCIL OF HEALTH AND THE CONDENSED M.B.B.S. COURSE

The Central Council of Health in its last meeting held in Delhi has recommended to all State Governments the continuance of condensed course of M.B.B.S. for the Medical Licentiates for a further period of at least five years. The Indian Medical Association has been trying for a long time for the continuance of this course, as it means provision of facilities for higher education and post-graduate training for persons who are desirous of having the same. So long there is a demand for this Course, we think the government should arrange extension of facilities for this training because it is the fundamental duty of every government to extend unreservedly all facilities for further education.

We must however offer our thanks to the Central Council of Health and particularly to the Union Health Minister who appreciated the move of our Association in this matter and extended the desired facilities.

CURRENT MEDICAL LITERATURE

Myocardial Changes in Potassium Deficiency

McAllen (*Brit. Heart J.*, **17**: 5, 1955) reports from the West Middlesex Hospital, London, the myocardial changes observed post mortem in 2 patients in whom prolonged potassium deficiency had been present. The first patient, a man aged 41, had had idiopathic steatorrhoea for over 3 years. The electrocardiogram showed a flat T wave in the standard leads and a slight depression of the S-T segment with an inverted T wave in Leads V_5 and V_6. At this time the serum potassium level was 12·1 mg. per 100 ml. With dietary treatment and the administration of 10 g. of potassium chloride daily these changes disappeared and the patient was discharged. Three years later there was a severe relapse and the patient was readmitted to hospital. The serum potassium level was again very low, and in spite of all treatment he died within a few weeks.

The second patient, a woman of 49, had chronic ulcerative colitis and was under observation for 4 years. During that time she had a series of thrombo-embolic episodes, including one suggestive of cardiac infarction. The electrocardiogram showed a depressed S-T segment and an abnormally low or inverted T wave with a large U wave. The serum potassium level was 11 mg. per 100 ml. and rarely rose above 12 mg. per 100 ml. in spite of large daily doses of potassium. At necropsy widespread myocardial lesions were found in both cases, although the coronary arteries were apparently patent and free from disease. In the second case evidence of focal necrosis of the myocardium was noted. The cardiac lesions are considered to have been the direct result of prolonged potassium deficiency.

A Combination of Hypotensive Agents

Smith and others (*Am. J. M. Sc.*, **230**: 415, 1955) write:

Sixty-five patients with hypertension classified as mild in 14, moderate in 35, and severe in 16 were treated with a hypotensive preparation (Mio Pressin) consisting of Rauwolfia, protoveratrine, and phenoxybenzamine combined in fixed proportions.

Good results were obtained in 37 patients, fair results in 14, and poor results in 14. Sixty-three per cent of the patients had become normotensive by the conclusion of the study.

Side effects consisted of nasal stuffiness (24 times), fatigue (36 times), loss of semen (8 times), and one each of palpitation and weight increase.

Severity of side effects was usually mild and required discontinuance of therapy in only 7 of the patients treated. The most prevalent side effects, nasal stuffiness and fatigue, could usually be controlled by using antihistamines for the former and d-amphetamines for the former and d-amphetamine sulphate for the latter. The use of amphetamines as adjuvant therapy had no adverse effect on the blood pressure response.

Based on the experience reported, the combination of agents studied is felt presently to be the hypotensive preparation of choice, wherever the hypertension may be inferred to be the result of complex or obscure processes rather than a specific etiological factor.

Inhibition of Hypothalamic, Medullary and Reflex Vasomotor Responses by Chlorpromazine

Dasgupta and Werner (*Brit. J. Pharmacol.*, **9**: 389, 1954, Ref. *Abst. World Med. Bull.*, **17**: 437, 1955) in order to determine whether, and under what conditions, chlorpromazine could block vasomotor responses centrally, doses of 0·25 to 0·5 mg. of chlorpromazine ("largactil") injected intracisternally into rhesus monkeys anaesthetized with allobarbitone caused a fall in blood pressure of 30 to 50 mm. Hg. The pressor reflex elicited by clamping both carotid arteries was abolished for at least 40 minutes, but the response to the intravenous infusion of adrenaline was unaltered.

In decorticated cats the intravenous injection of 50 to 100 μg. of chlorpromazine per kg. body weight caused a large reduction in blood pressure, and also abolished the rhythmic boold-pressure waves. The response to electrical stimulation of pressor areas in the hypothalamus and medulla with a Horsley-Clark electrode was abolished for several hours. However, in cats anaesthetized with chloralose, chlorpromazine produced no significant lowering of blood pressure, and stimulation of the posterior hypothalamus gave variable results, even in cats in which the respiration was paralysed by decamethonium and which were being artificially ventilated. The authors conclude that these experiments gave no real evidence of a central vasomotor reflex blocking action specific to chlorpromazine, and suggest that other central depressant drugs should be tested under similar conditions.

Respiratory Hazards of Opiates

Eckenhoff and others (*Surg. Gynec. & Obst.*, **101**: 701, 1955) write:

Data obtained in man have been presented demonstrating the prolonged respiratory depressant effect and other side-effects of morphine, meperidine, codeine, alphaprodine, dromoran, dihydromorphine, and methadone. These data have been compared with similarly obtained observations with secobarbital.

Elevation in "alveolar" pCO_2, depression in respiratory minute volume, and reduced respiratory response to elevation in "alveolar" pCO_2 have been shown to be an invariable accompaniment of opiate administration. Respiratory rate was found to be an unreliable clinical index of respiratory depression by opiates.

Gastric and Intestinal Motility with Different Drugs

Andrew (*Australasian Ann. Med.*, **3**: 305, 1954, Ref. *Abst. World Med. Bull.*, **18**: 7, 1955) from an analysis of the study on the gastric and intestinal motility with different drugs e.g. morphine, atropine, hexamethonium bromide and 'Banthine' writes:

The study was made at the Baker Medical Research Institute and Alfred Hospital, Melbourne, by recording the pressure changes in balloons introduced into the

pyloric antrum, the duodenal cap, and the proximal jejunum, the balloons being attached to a 4-lumen Miller-Abbott tube; the fourth channel served for the introduction of drugs into the stomach. The 12 subjects included 8 patients with active duodenal ulcer and 1 with gastric ulcer, and 3 healthy medical students. The behaviour of the normal gut is discussed and emphasis is laid on the great variability which may be observed in the same individual within a short space of time. The complexity of the recorded wave form and the speed with which one form of activity may change to another suggest that results obtained over a short interval are likely to be more informative than those of longer experiments. The changes produced by drugs are: (1) relative or absolute quiescence, or complete inhibition; and (2) augmentation of the waves or the production of tetany-like spasm with the occurrence of superimposed small waves at the rate of 9 to 12 per minute. A preliminary test in this investigation showed that the introduction of 200 ml. of normal saline by Miller-Abbott tube did not alter the motility of the stomach or upper small intestine.

In 2 of the patients with duodenal ulcer one-quarter grain (16 mg.) of morphine sulphate injected subcutaneously caused spasm of the duodenal cap and jejunum within 2 minutes of injection. This accords with the well-known constipating action of morphine by causing delayed intestinal propulsion. Atropine had a pronounced inhibitory action at all three sites when 1/100 grain (0·6 mg.) was given subcutaneously or intravenously to 2 patients, one with gastric and the other with duodenal ulcer, the action appearing within one minute. A dose 1/200 of a grain (0·3 mg.) had no effect in a normal subject and produced only a transient partial loss of intestinal activity in the patient with gastric ulcer. Hexamethonium bromide (100 mg. given intramuscularly) was tested in one patient with duodenal ulcer; it took effect after one minute and caused complete inhibition for 85 minutes at all three sites. "Banthine" (methantheline bromide) was given by stomach tube to 3 patients with ulcer and the 3 healthy controls. The effect of a dose of 100 mg. in 10 ml. of water varied from complete inhibition at all 3 sites to a partial effect on the duodenum and jejunum only. The action of the drug began after a delay of from 5 to 30 minutes and lasted for periods varying from 19 to 65 minutes.

The findings are discussed, particularly those produced by methantheline. It is considered that the therapeutic action of this drug in peptic ulceration may also involve depression of acid secretion. But on the whole no clear difference in the response of normal subjects and patients with peptic ulcer was apparent, and the author concludes that the effect of dose and individual variation of response are probably more important factors in this respect than the presence or absence of ulceration.

Needle Biopsy of the Liver

MOREY AND OTHERS (*J.A.M.A.*, **158**: 1489, 1955) have carried out 139 liver biopsies on 119 patients by the Silverman needle through an abdominal (120 cases) or transthoracic approach (19 cases) for various conditions, where liver was supposed to be involved. In 86·2 per cent an effective diagnosis was made. In 13·8 per cent (19 cases) diagnosis was missed, in two of which the error was due to failure to obtain sufficient tissue. Majority of failures have been in the cases of metastatic carcinomas but there have been four cases (4·6 per cent) where a diffuse hepatic disease was missed in spite of an adequate cone of liver tissue. The complications were haemorrhages (4 cases) with one death (0·72 per cent), transient abdominal pain (16 cases, 11·5 per cent) requiring a single dose of narcotic, fall in blood pressure (0·72 per cent) low blood pressure requiring transfusion (0·44 per cent). There were no complications in 85 per cent. In 3 of the 4 cases with haemorrhages the prothrombin time was less than 40 per cent and in the 4th 75 per cent.

The authors recommended vitamin K therapy in all cases with significant depression of prothrombin time which should be continued even postoperatively until all danger of haemorrhage has passed; they stress the evaluation of prothrombin consumption time since it may be dangerously low even in the presence of relatively normal prothrombin activity.

It is interesting to note that more complications occur in the transthoracic approach as against abdominal approach. The former approach should therefore be reserved for cases in which the abdominal approach is impossible, and in which the information obtained from a biopsy outweighs the risk. The advantage of this mode of approach over that of exploratory laparotomy should be carefully considered.

Sigmoidoscopic Findings in Chronic Bowel Disorders

MUKHERJEE AND CHATTERJEE (*Calcutta M. J.*, **52**: 269, 1955) from an analysis of sigmoidoscopic findings in 205 cases of chronic bowel disorders observe that the incidence of chronic bowel disorder in tropics in series under review was maximum in the second and third decade of life. Chief presenting symptoms, in order of importance were pain abdomen, definite history of recurrent attacks of dysentery, loss of weight, alternate constipation and diarrhoea, constipation only and severe degree of anorexia. The most important pathological changes observed through sigmoidoscope were congestion of the mucous membrane with or without ulcer, next in order of frequency was excessive secretion of mucus. About 10 per cent of cases showing gross pathological lesion of the gut wall, had loss of elasticity of variable degree as a result of fibrosis. This causes rigidity of the gut wall and narrowing of the lumen which is responsible for extreme pain and tenderness on the part of the patient during sigmoidoscopy in these cases.

As the authors maintain that the involvement of lower sigmoid and rectum in chronic amoebic dysentery is near about 72 per cent—and in bacillary dysentery as well as in idiopathic ulcerative colitis the rectum is almost invariably involved—the value of sigmoidoscopy in the diagnosis of chronic bowel disorders becomes evident. This is particularly true when the laboratory fails to provide the clinician with correct diagnosis of a chronic bowel disorder case after repeated attempts. In such cases, sigmoidoscopy may be the only procedure to come to a conclusive diagnosis.

Serum Sodium and Potassium and Urinary Ketosteroids in Healthy Adults

DAS GUPTA AND SINGH (*Indian J. M. Research*, **44**: 31, 1956) observe:

Serum sodium, serum potassium, and urinary excretion of 17-ketosteroids were determined in 15 healthy men, aged 21 to 46 years, and 17 healthy women, aged 18 to 45 years of North India (Punjab).

Serum sodium levels were 326±3 mg. per 100 c.c. in men and 323±1 mg. per 100 c.c. in women.

Serum potassium values were found to be 19·2±0·3 mg. per 100 c.c. in men and 18·3±0·2 mg. per 100 c.c. in women.

Daily urinary excretion of 17-ketosteroids in men and women, under present investigation, were 16·94±0·9 and 8·56±0·75 mg., respectively.

Tropical Splenomegaly of Unknown Aetiology and B. T. Malaria

KONAR AND ROY CHOWDHURY (*Indian J. M. Research*, **43**: 685, 1955) give in following lines the summary of their observations on the response of tropical splenomegaly of unknown aetiology to induced benign tertian malaria:

Malaria could not be induced to patients suffering from 'tropical splenomegaly of unknown aetiology'.

It could be induced to 'control' cases and to a case of 'tropical splenomegaly of unknown aetiology' after his spleen had been removed. The same patient had resisted induced malaria before splenectomy.

Malaria could be induced to patients suffering from portal cirrhosis of the liver but not to cases of 'tropical splenomegaly of unknown aetiology' with cirrhosis of the liver.

Splenomegaly with the associated changes in the spleen, viz., dilatation of the splenic sinuses and proliferation and hypertrophy of reticulo-endothelial cells is most probably responsible for the resistance of cases of 'tropical splenomegaly of unknown aetiology' to induced benign tertian malaria.

Antibiotics and Antibiotic Combination in Amoebiasis

SENECA (*Am. J. Digest. Dis.*, **22**: 247, 1955) gives in the following lines the summary of his observations:

I. Antibiotic synergism on Endameba histolytica:
   1. Equal amounts by weight of bacitracin+polymyxin exert 0 to 4 fold synergism.
   2. Equal amounts by weight of neomycin+polymyxin exert 2 to 8 fold synergism.
   3. One to 20 ratio of anisomycin+tetracycline exerts 2 to 16 fold synergism for oxytetracline and 4 to 8 fold for anisomycin.
   4. One to 20 ratio of anisomycin+oxytetracycline exerts 2 to 4 fold synergism for oxytetracycline and 0 to 8 fold synergism.

II. A review of the literature revealed that:
   1. Oxytetracycline is the drug of choice in amaebiasis, and fumagillin is the next in line.
   2. Resistance of *E. histolytica* was reported to chlor- and oxy-tetracycline.
   3. Antibiotic synergism was reported against *E. histolytica* in polymyxin+circulin, tetracycline +oxytetracycline, tetracycline or oxytetracycline +carbomycin, fumagillin+erythromycin or neomycin combinations.

Transient Cushing Syndrome

ZONDEK AND LESZYNSKY (*Brit. M. J.* **1**: 197, 1956) report a case of a 54-year-old woman who, when first seen, had a frank Cushing syndrome (typical obesity with moon-face, hypertension, red striae, insulin-insensitive diabetes, secondary amenorrhoea, and mild hirsutism). The basal metabolic rate was +17%. A notable feature was a marked tendency towards water and salt retention. Dehydration therapy resulted in weight loss and complete disappearance of the Cushing signs. However, the tendency towards water and salt retention remained manifest throughout the whole course of observation. After a short period of well-being neurological abnormalities suggestive of a cerebello-pontine lesion associated with a pronounced bilateral hemianopsia developed. An organic cerebral process was excluded by various encephalographic investigations. Dehydration therapy resulted in further weight loss and almost complete regression of the neurological and ocular phenomena.

About a year later a phase of anorexia associated with considerable spontaneous weight loss (about 35 kg.), hypotension, fall of the B.M.R. and of gonadotropin excretion became manifest which lasted around eight months. Again a year later the patient experienced a spontaneous change to the other extreme: voracious hunger and thirst accompanied by rapid gain in weight (39 kg.), moderate rise in blood pressure, rise in gonadotropin excretion, hypermetabolism, and latent diabetes mellitus—that is, though obese, she did not display the symptomatology of Cushing's syndrome. The patient also suffered from disturbances of sleep rhythm during the later two stages. During the whole-course of observation she was mentally very unstable without exhibiting signs of genuine psychotic alterations.

The majority of the morbid phenomena as well as their fluctuability point to hypothalamic involvement, and their response to dehydration therapy to cerebral oedema affecting various centres during the different stages (pseudo-tumor cerebri) as the underlying cause. This hypothesis is also readily compatible with the appearance and regression of the neurological and ocular manifestations.

On the strength of this and similar observations made by the authors, it is suggested that in cases of Cushing's syndrome in which evidence of gross pituitary or adrenocortical pathology is lacking a hypothalamic origin of the condition be taken into account. Such cases may respond well to conservative therapy—that is, drastic dietary restrictions and dehydrative measures—especially when a marked tendency towards water and salt retention is present, and may even regress spontaneously (Authors' summary).

Clinical Trials with Prednisone

DIVEKAR AND PATEL (*J. Postgraduate Med.*, **2** : 1, 1956) in reporting on clinical observations on therapeutic effect of prednisone (deltadihydrocortisone) in rheumatoid arthritis, systemic lupus erythematosus, hypersensitivity phenomena, ulcerative colitis and nephrotic syndrome observe :

17 cases were subjected to clinical trial with prednisone (a new synthetic analogue of cortisone). Following cases were selected :

1. Rheumatoid arthritis—8 cases; 2. systemic lupus erythematosus—2 cases; 3. hypersensitivity phenomena —3 cases, (serum sensitivity, serum sensitivity and status asthmaticus, bronchial asthma during acute exacerbation); 4. ulcerative colitis—1 case; and 5. nephrotic syndrome—3 cases.

Haematologic and metabolic changes during prednisone therapy were studied. The clinical observations on the therapeutic response of the drug in above diseases, compare favourably with those seen with corticotropin and cortisone group of drugs.

Moreover, the drug seems 4-5 times more potent (milligram for milligram) than cortisone.

Preliminary observations indicate that this enhanced potency is not associated with a proportionate rise in undesirable side effect.

Among the side effects, the more important ones are facial rounding, epigastric distress, and the diuretic effect of the drug.

The diuretic effect of prednisone is emphasized in relation to its use in nephrotic syndrome where a prompt response was obtained without the undesirable water retention. The beneficial effect in nephrotic syndrome was impressive.

Prednisone was found effective in systemic lupus erythematosus and hypersensitivity phenomena. The use of prednisone is advised only in intractable cases of hypersensitivity phenomena.

The therapeutic effects of prednisone in ulcerative colitis need further clinical trials.

From these preliminary clinical trials, it appears that prednisone perhaps may be the drug of choice in the management of collagen diseases and nephrotic syndrome.

Posterior Penetrating Gastric Ulcer

CARNOLO AND OTHERS (*Surg. Gynec. & Obst.*, **101** : 759, 1955) from a study of 91 ulcerating lesions of the posterior wall of the stomach which, on gross inspection, were found to be of the "peptic" type and which had penetrated to become attached to adjacent structures observe :

1. The organ which these ulcers most frequently penetrated was the pancreas. Neither the ulcers themselves nor dissection of the ulcers from the pancreas, sometimes leaving the crater *in situ*, resulted in clinically significant pancreatitis.

2. Epigastric pain, haematemesis or melena or both, vomiting, and pain referred to the back were the commonest complaints of the patients in this series.

3. The history, physical findings, laboratory data, and results of palpation and inspection of these lesions at the time of operation often strongly suggested a diagnosis of carcinoma of the stomach.

The incidence of malignant disease, however, was only 3·3 per cent. It proved impossible to distinguish the few malignant lesions from the many benign ones at operation on the basis of gross criteria alone. It follows that the surgeon faced with a large, fixed ulcerating lesion on the posterior wall of the stomach without obvious signs of malignancy should remember that most lesions of this type are benign and should proceed with resection whenever possible to avoid the error of regarding the lesions as malignant and inoperable (Authors' summary).

Treatment of Vernal Conjunctivitis

ALIMUDDIN (*Brit. J. Ophthal.*, **39** : 540, 1955) from an analysis of the results of the treatment of 1,050 cases of vernal conjunctivitis observes : Certain articles of diet (onion, spices, beef, eggs, tamarind, citrus beverages, and brinjal) were reported by the patients to aggravate their symptoms. The treatment of associated intestinal worms, and skin and E.N.T. allergies, and the topical use of cortisone gave the best palliative and curative results.

CURRENT TOPIC

ARTIFICIAL LIMB CENTRE (INDIA)

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History—The manufacture of artificial limbs was started at Sialkot in 1936 on a small scale under the supervision of Surgical Specialist, Military Hospitial, Sialkot. During the Second World War the number of amputees increased to a great deal and the demand for artificial limbs went on increasing. As the main base hospitals were located near Poona, the artificial limb centre was also shifted to Poona in February 1944. It was shifted to Kirkee in 1945 and again to Lahore in January 1947.

After the partition of the country in August 1947, a new centre was established at Poona in February 1948.

A few medical officers and twelve technicians were sent to England to learn the manufacture of artificial limbs in 1946-47. This nucleus of trained personnel in turn taught the rest of the workers. At present this is the fourth largest centre in the world.

Till the end of 1950, this centre was manufacturing artificial limbs and surgical appliances only for the Armed Services personnel. Ocassionally civilians could get the artificial limbs on payment from this centre. The number of civilians utilising this centre was small in the beginning but at present it is above 40 per cent of the total number of patients reporting to the centre.

The Procedure for Getting Artificial Limbs by the Civilians—The civilian patients have to apply to the Office of Director General Armed Forces Medical Services —Ministry of Defence, New Delhi. The sanction is normally granted in 8-10 days' time. After the sanction is obtained the patient reports to the centre, and is admitted to Military Hospital, Poona, if he desires. The payments to be made vary from Rs. 3/- to Rs. 8/- or more depending on the income of the applicant. If he does not like admission, he attends the centre as an out-patient, in the morning hours on weeks days.

Duration of Stay at Artificial Limb Centre—On an average it takes about 4-6 weeks depending on the type of amputation. It takes a little longer in the case of double amputees. The stump is examined and necessary treatment by the way of stump exercises and bandages are carried out. The limb fitting surgeon prescribes the necessary artificial limb for the patient.

On an average it takes about a week to manufacture the limb. This artificial limb is sent for trial to the fitting wing. The patient tries the limb under the supervision of the limb fitting surgeon and the limb fitters. All minor adjustments and corrections are done, height is checked, alignment seen and the joints are tested. Every day the patient gets more confidence and within two weeks time he can walk without the help of a stick or any type of crutches for all single amputations. As soon as the patient and the surgeon are satisfied, the unfinished limb is sent to the factory for final finish. The final finished limb is sent to the fitting wing for the final trial. The patient uses it for a day or two and if he is satisfied, he is discharged from the centre. He signs a certificate before his discharge which states that he is absolutely satisfied with the fitting of the limb. In case any defects are noticed before he is discharged, it is always rectified to the minutest detail.

The life of an artificial limb is 4-6 years, if properly used and looked after.

Materials used for the Manufacture of Artificial Limbs—All artificial limbs for the lower extremity are made of seasoned willow blocks. This was imported from England till recently, but Kashmir willow which is equally good is used now. It takes about 3 years to season willow.

Natural seasoning is done in the shade. During this period the big logs are cut in proper sizes, the ends are waxed, centre holes are bored upto certain length of the block and preservatives applied to save it from various type of insects. After three years from the time of cutting the trees the willow is ready for use. In this condition very little moisture is left and there is no danger of cracks to the wood. The joints are made in the army factory and there is no imported material used for the manufacture of artificial limbs for the lower extremity. Weight of below knee limb is about 6 lbs., and weight of above knee limb is about 8 lbs. The metal limbs are not manufactured as there are no special advantages. There is no doubt the weight of the metal limb is slightly lighter but there is danger of its warming up in summer and danger of rust during the rainy weather

The artificial arms manufactured are of two types. (1) The dress arms and (2) the working arms. The dress arm is mainly for show. One can eat, dress, write or hold a brief case. This is the arm which is required by a person who is not supposed to do heavy work. This arm is made of blocked leather, chemicals and some times of metal only.

The working arm is more useful for a working man who has to do strenuous duties. This arm is heavy and is made of leather and metal only and can bear the stress and strain of heavy work.

Certain joints for these artificial arms are still imported from U.K. but very shortly these joints will also be manufactured in the factory attached to the Limb Centre.

Efficiency after Fitting of Artificial Limbs—The leg amputees after fitting of artificial limbs can walk, run, climb stairs, can cycle, ride a motor cycle, can drive a car, a truck or a tractor. As a matter of fact, they can do all duties which a normal individual can do except that they cannot run fast. The double amputees whose stumps are below the knees will also perform all the duties enumerated above. An amputee who is amputated above the knees cannot perform all strenuous duties with a shaped limb. It is a very major disability and only sedentary work can be done.

In the case of arm amputees, different types of attachments are given which are attached to the artificial forearm. After fixing up these appliances, the patient can do a carpenter's or blacksmith's duties. He can write, smoke, hold cards in the appliance, can brush shoes, type and can use knife, fork and the spoon. He can dig in the field with pick, and use his shovel. He can lift a bucketful of water and do many other types of work. He can do very fine type of work as silversmith's duties. An arm amputee with a strong will can do a lot of things and can even use a gun for shooting purpose.

This centre has employed about 15 amputees. They are doing full time duties like other technicians. It is stressed that action may be taken to employ other amputees in various factories and offices. A certain percentage of these disabled persons ought to be taken in various factories of the country as has been enforced in U.K. and U.S.A.

NOTES AND NEWS

Retrospective Recognition of Qualifications

The Medical Council of India at its 45th session held in New Delhi on 10 March 1956 protested against the Government of India's notification removing the dates of recognition previously given against medical qualifications of some of the universities and licensing bodies, thus recognising these qualifications retrospectively from the date of their institution.

The qualifications thus affected are M.M.F. (State Medical Faculty of West Bengal), and the M.B.B.S. of the universities of Bihar, Poona, Utkal, Gujarat, Nagpur and Rajputana.

In his presidenital address, Dr. C. S. Patel said: "This decision of the Government, which has been directly communicated to the respective universities and licensing bodies and the State Governments, is in utter disregard of the considered views of the Council. It is really a question of principle, viz., whether it is justifiable to give retrospective effect to the recognition of a qualification or qualifications obtained in a year, when the standards of equipment, personnel and teaching of the institutions concerned were not adequate and the standard of the examinations of the institutions concerned was low and left much to be desired. The giving of such retrospective effect indiscriminately, as has been done by the Government of India, creates a very awkward precedent and is bound to give a setback to the efforts of the Council to improve standard in medical colleges, as the authorities of such colleges will feel that they can go slow in meeting the demands of this Council and the universities concerned in connection with the maintenance of proper standards and yet expect to get retrospective recognition from the Government of India to the qualifications obtained by studying at such institutions."

"There is also the question that it will give a bad impression to bodies outside India with whom we have reciprocal arrangements for recognition of medical qualifications granted in India and the respective countries.

Use of Synthetic Dyes in Food

The recent conference at Geneva under the joint auspices of the World Health Organization and the Food and Agriculture Organization discussed the question of potential hazards to health from the use of innumerable chemicals in flavouring, colouring or preserving food.

The results of recent surveys have shown that more than 800 chemicals have been in use in the United States as food additives, 500 in Sweden, and more than 1,000 in Germany. Colours are generally added to make food look more attractive. Formerly they were of animal, vegetable, or mineral origin, but the situation has been complicated since the synthesis of "coal tar" colours. More than 2,000 synthetic dyes have been prepared and about 80 are currently permitted in food. There is no internationally agreed list for either natural or synthetic colours, although attempts have been made to obtain acceptance in Europe of a list of 7 synthetic and 5 natural colours.

In view of this situation, the conference, presided over by Dr. Norman Wright (U.K.), emphasised that international action was necessary to deal with this tremendous problem and consequently recommended uniform methods of evaluating the safety of additives and the drawing up of general principles for their use. The conference also urged that priority should be given to the proposed inquiry into preservatives, including antimicrobial and anti-oxidants, which were of special value in limiting wastage and deterioration in the world's available food supplies. They are particularly valuable in tropical areas where storage presented special problems.

Insect Resistance to D.D.T.

The development of resistance by disease-bearing insects to insecticides has become a public health problem of the greatest importance, according to a resolution adopted by the executive board of the World Health Organization which met in Geneva on January 31.

Dr. M. G. Candau, Director-General of the organizations, said that 32 countries had reported insect resistance to D.D.T. and other new insecticides. Various types of malaria-bearing mosquito, body lice which spread typhus, fleas responsible for plague, and a strain of mosquito from Trindad which spread yellow fever had all shown themselves to be extremely resistant to insecticides.

"Should the degree of resistance, in vectors of diseases such as malaria, yellow fever, plague, and typhus reach the point where control by available insecticides is no longer possible, disastrous results from a health viewpoint will inevitably occur in many parts of the world," Dr. Candau said. The resolution adopted said that a determined effort must be made to avoid what might well become a catastrophe for world health, and that the world must assume responsibility for coordinating and stimulating research to combat this new danger.

UNICEF's Plan for Aid to India

A million dollars for development of rural health services throughout India will be recommended by the executive director of the UNICEF.

India will also get part of the $855,000 towards her emergency feeding programme. She is sharing this allotment with Korea.

UNICEF sources said in allocation of $25,000 for fellowships at a Calcutta training centre will enable ten non-Indian doctors to take postgraduate study in maternal and child health.

Both in India and Pakistan vaccination programmes to prevent tuberculosis will be supplemented by domiciliary treatment of active cases with drugs contributed by the fund.

In all, allocations totalling nearly $8·50 million for child aid programmes in 47 countries and territories are to be recommended at the spring session of the fund's executive board.

XV International Congress of History of Medicine

The 15th International Congress of History of Medicine will be held in Madrid and Salamanca, in the latter half of September 1956.

International Congress of History of Science

The 8th International Congress of History of Science will be held in Florence and Milan, in the first week of September 1956.

University Centenaries in 1957

Established in 1857, the year of the first war of independence in India, Calcutta University—the oldest in this country—will celebrate its centenary from January 19 to January 24 next year. The University authorities

desire to make the centenary a national celebration and expect that the alumni, wherever they are, will think of their Alma Mater on this occasion and give their help and co-operation. A week later, Madras University, and in early February Bombay University will also celebrate their centenary.

There would be a number of functions in celebration of the Calcutta University centenary ending on January 24 with a special convocation for distinguished guests. Among others, many eminent people from different parts of this country and abroad who would be attending the Indian Science Congress session in Calcutta at the time would be invited to take part in the celebration. A board of editors has been appointed to write a history of the university.

CORRESPONDENCE

The Editor is not responsible for the views expressed by correspondents

Congenital Syphilis

SIR,—I am really thankful to Dr. R. V. Rajam and Dr. P. N. Rangiah for expressing their views on my article "Congenital Syphilis" (*J. Indian M. A.*, **26**: 75, 1956). Indeed such discourses are always welcome inasmuch as they offer opportunities to the writer in removing any misgiving which may arise in the mind of the reader, but which did not occur to the writer himself.

It is true that the term congenital syphilis is widely used, but certain authors like Müller (1935) and Hoffmann (1935) dislike the term congenital which according to their opinion gives the impression that the disease has something to do with copulation, whereas it is first transmitted from the mother to the child. They prefer the designations, innate syphilis or syphilis innata or connatalis, which, according to them, express the actual conditions more satisfactorily. The term 'innate' exists in the literature and is, therefore, neither an addition nor new.

That cases of congenital syphilis are becoming less nowadays, does not mean that they are scarce. It is only a relative term. The very fact, rightly mentioned by the learned correspondents, that large number of adult population attends the V. D. clinics, particularly in urban areas, points out that the incidence of congenital syphilis must come down, by simple logic. Besides treatment in the V. D. clinics, regular antenatal care in the different urban hospitals should cause a decline in the incidence curve. Above all, with the advent of comparatively simplified method of treatment with penicillin and since the general practitioners usually start the treatment whenever there is suspicion of syphilis, specially during pregnancy, there is no wonder that the chances of children being born with spirochaetal infection are becoming less. Accepting that certain section of population never try to get the medical benefit available, there is no doubt that at least a certain section of our people, and that in increasing numbers, is utilising the V. D. clinics and other measures available for the treatment of syphilis. It therefore follows *pari passu* that a greater cross-section of the child population is expected to be free from spirochaetal infection, who would have otherwise become infected. Some of the pediatricians attached to different hospitals in the city of Calcutta are of the impression that in recent years the case incidence of congenital syphilis is rather on a low level as compared to previous years.

The pathogenesis of varied manifestations of congenital syphilis particularly the latent character of the disease has been brilliantly discussed by Müller (*loc. cit.*). He has described spirochaete 'nests' and tried to explain the cause of latency and the varied manifestations of the disease. According to him—"It is very noteworthy that in infants spirochete 'nests' are found in the organs without these organs exhibiting visible disease symptom .... Later they may become active and produce manifest symptoms."

While discussing the clinical features of the disease, it is wise and convenient to describe the bony lesions under pseudoparalysis since pseudoparalysis is one of the important bedside clinical manifestations of the underlying osteochondrial pathology. As regards the terms used for describing the radiological appearance of the bony lesions, it matters very little whether one expresses it as 'moth eaten' or 'saw tooth' appearance, so long the person describing it, has a mental picture of the actual radiological appearance. For information, the term 'moth eaten' has been used by various authors—Ellis (1951), Jeans (1948), O'Reilly (1924). Regarding the questions of epiphysitis and secondary pyogenic infection I would refer the learned correspondents to the photograph with the caption 'syphilitic epiphysitis with secondary suppuration' printed on page 578, in the fifth edition of Mitchell-Nelson's Text Book of Pediatrics (1953). The author of the article of the same book further describes that 'suppuration of the bones and overlying soft tissues is always due to secondary invasion by pyogenic organisms. .... This suppuration is not an uncommon finding in children with severe lesions of the skin and mucous membranes'.

The statement that 'the central nervous system is frequently involved in early congenital syphilis' is not extraordinary, since eminent authors like Nabarro and Shaw (1953), Jeans (*loc cit.*), Dodd (1953) have described frequency of the involvement of central nervous system. Katherine Dodd writes "Neuro-syphilis is unfortunately the second most common lesion of late congenital syphilis". The statement made in the article that changes in the spinal fluid are seen in more than 75 per cent of cases, should be read as 35 per cent. instead. It is an oversight which I regret.

It is quite agreed that antisyphilitic treatment, every time during pregnancy, is not necessary, provided it can be guaranteed that the mother has complete antisyphilitic treatment previously, shows no clinical manifestations of the disease, is serologically negative and no reinfection has occurred. From the practical point of view, however, it is rather difficult to be always sure that reinfection has not occurred or complete anti-

syphilitic treatment has been given previously. That is why it is always wise to institute antisyphilitic treatment to every pregnant syphilitic woman.

"Penicillin, undoubtedly has proved to be an excellent spirillicide, but it has not been in use long enough to permit full evaluation of its place in the treatment of syphilis—Philip Jeans (*loc. cit.*). From the report of W.H.O. (1954), we know that, taking the world as a whole, 28·9 per cent of the clinics used penicillin in conjunction with other drugs in treating congenital syphilis. It is a fact, therefore, that the method of treatment with penicillin alone has not yet received universal acceptance, at least not so in practice. Besides, regular parenteral therapy is not practical, since it is not unlikely that certain parents will fail to bring their children for regular pricking specially when the clinical manifestations of the disease are not alarming. Different workers are using long-acting penicillin benzyl-amine salt—diamine and also oral penicillin and other broad spectrum antibiotics to avoid the question of needle prick. As a matter of fact we are also using them in our hospital practice. So long the results are quite encouraging but it is too premature to dogmatise its wide acceptance. About the use of acetarsone—there is difference of opinion. Morgan (1949), Jeans (*loc. cit.*), Dodd (1953), Sheldon (1955) advocate the use of the drug and Jeans writes "Acetarsone has, as its chief advantage, considerable effectiveness against syphilis when administered by mouth". I am, etc.,

Calcutta. S. P. BHATTACHARJEE.

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REVIEWS

British Medical Bulletin—Vol. II, No. 3, 1955. Published by the Medical Department : The British Council, 65, Davies Street, London W. 1. Pp. xvii plus 171-242. Price 14 sh.

The September issue of this journal is on surgery of the heart and thoracic blood vessels. The subjects included are selection of patients for surgery for congenital and acquired heart diseases, operative methods, anaesthesia for cardiac surgery, hypothermia and cardiac resuscitation. Each article has been presented in a masterly way by an expert on the subject concerned. The authors have presented the results of their own experience concisely but adequately. Those who are interested in cardiology and cardiac surgery will profit much by reading this number.

Fourth Annual Report on Stress—Edited by Hans Selye and Gunnar Henser. Published by Acta Inc., Montreal, Canada. Pp. 749. Price $14·00.

This volume represents the fourth of a series of annual supplements to the book *Stress* by Hans Selye published in 1950. For the last few years there had been hardly any more fascinating and comprehensive theory in the medical science than the conception of General Adaptation Syndrome of Dr. Hans Selye. This renowned endocrinologist in his numerous publications relentlessly propounded his theory which he tried to establish from his various ingenious experimental procedures. General Adaptation Syndrome and the stress as an aetiological factor in various ill-defined medical conditions have not been wholly accepted but it cannot be denied that this theory is having a tremendous impact on modern medicine and an ever-increasing number of publications on the subject is forthcoming every year either to support or to contradict this conception. In critical evaluation of these publications who would be the best person to review and to summarise the data than the original author of the theory himself! This task of compiling and analysing the works in this field has been successfully done by Dr. Selye for the last four years. In this act Dr. Selye did not put unnecessary bias on the publications supporting this theory only, but tried to act as a guide to the entire literature on stress, some of which even ran contrary to his theory. As a reference book on this special subject and to those who are specially interested in this field and in endocrinology in particular, this is a valuable companion. Although a useful book for every library, advanced students and teachers, it would hardly claim to be of any use to the general medical men.

The 1955-56 Year Book of General Surgery—Edited by Evarts A. Graham, A.B., M.D., with Section on Anaesthesia, edited by Stuart C. Cullen, M.D. The Year Book Publishers Inc., 200 East Illinois Street, Chicago 11, U.S.A. Price $6·00 post paid.

This book, covering a total of 655 pages, is one of the well-known 13 volumes of the Year Book series.

Surgery is a rapidly enlarging subject, undergoing marked advance in its outlook and sphere of work. Compared to circumstances obtaining even 10 years ago, modern surgical concepts and procedures have changed and are steadily expanding in scope. Rapid advances are being made in neurosurgery, thoracic surgery and cardiovascular surgery; while many of the surgical operations of previous days, consequent upon various infective processes, are now rarely needed. Examples of this latter group are empyema, acute osteomyelitis, mastoiditis and complications of gonorrhoea. Also surgical procedures necessitated by various types of traumatic injuries and burns met with in industry and modern travel are becoming increasingly necessary and frequent. Modern facilities and operative skill have brought increased excursions in extensive radical operations for malignant growths in various situations, notably the pelvis, although the ultimate utility of such extensive and mutilating operations has recently been questioned by many. Similarly many are the advances, discoveries and improvements made in recent years in the field of anaesthesiology.

A practising physician who wants to keep himself posted with modern advances made in the fields of surgery and anaesthesia, as also the operating surgeons will find this book useful and stimulating. The abstracts have been arranged in several sub-sections and chapters, thus making it easier for reference. The abstracts in the section on Anaesthesia are also equally instructive and well-selected.

The paper, printing and binding are all good.

Antibiotics in Nutrition (Antibiotics Monographs No. 4) —By Thomas H. Jukes, PH.D. Foreword by Henry Welch, PH.D. and Felix Marti-Ibanez, M.D. A publication, 1955, of Medical Encyclopaedia Inc., 30 East 60th Street, New York 22, N.Y., U.S.A. Distributors outside U.S.A.—Interscience Publishers, Inc., 250 Fifth Avenue, New York 1, N.Y., U.S.A. Available of Asia Publishing House, Contractor Building, Nicol Road, Ballard Estate, Bombay 1. Cloth bound in board, 9¼"×6¼", 128 pages. Price $4·00.

The antibiotics are commonly defined as a group of soluble organic substances that are *produced by micro-organisms* and that are characterised by their property of inhibiting at low concentrations the growth activity or multiplication of other micro-organisms. The antibiotics were first developed and produced with the principal aim of fighting various infective conditions. Their use was later extended to preventive fields, and later on to promotion of active health and healthy growth (in some animals at least)—by feeding these antibiotics. Examples of pathogenic bacteria and protozoa invading the alimentary canal to produce clinical disease are indeed many, and medical men have been quite familiar with these for ages. But the concept of a symbiotic relationship between animals and the bacteria in their gastro-intestinal tract is, though less well known, also an old one; Louis Pasteur referred to the necessity of controlled studies in this respect. It appears to have been well established now that the rate and method of growth of young animals may be increased by adding relatively small quantities of certain antibiotics to the diet. In 1954 alone, some 400,000 pounds of such drugs were incorporated into feeds, effecting tremendous savings to the farmer. This new application for antibiotics will greatly widen the horizon of their usefulness as also markedly affect the nutritional and economic problems of the world.

The author, a renowned worker in this field, has covered the subject of this book in producing this very commendable monograph which is likely to be of great benefit and help to public health and research workers in this field as also to veterinarians, economic specialists and others generally interested in the uses of antibiotics in constantly expanding fields. A bibliography of over 400 references, will certainly help the more serious reader in the further study of related subjects.

OBITUARY

Dr. Meghnad Saha

On 16-2-56, Dr. Meghnad Saha passed away suddenly at Delhi. He was 63. Dr. Saha was born on October 10, 1893. He got his D.Sc. in 1919 and P.R.S. in 1920. In 1920 appeared his famous theory of "Thermal Ionisation" or "Theory of production of electrically charged atoms by heat". He showed that in the application of this theory, he could explain the physical conditions in the Sun and the Stars. This work secured for him international recognition in the field of science. He was elected a Fellow of the Royal Society of London in 1927.

Dr. Saha's activities were not merely confined to the domain of scientific research and the spread of scientific education in the country. He took an intense interest in the development of resources of the land and was a very active member of the National Planning Committee sponsored by the Indian National Congress in 1938.

Mme. Joliot Curie

Madam Irene Joliot Curie, physicist, Nobel Prize winner and daughter of Pierre and Marie Curie discoverers of radium, died on March 17, 1956 in the hospital of the Curie Foundation in Paris. She was 59.

Madame Joliot Curie discovered with her husband Frederic Joliot Curie the principle of artificial radioactivity, a principle essential to the later development of atomic energy.

She was born on September 12, 1897 in Paris.

Under the guidance of her mother she embarked upon a scientific career and co-operated with her during World War I in the French radiography service which extended its activities right up to the combat zone.

She was named an assistant in the science faculty of the Sorbonne in 1921 and soon published her first important work entitled "Research on the alpha rays of polonium" a substance extracted from radium and named in honour of the Polish origin of Marie Curie.

SUPPLEMENT
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XXII ANDHRA STATE MEDICAL CONFERENCE, KURNOOL

The 22nd Andhra State Medical Conference was held on the 8th and 9th January, 1956. Delegates, visitors, guests and invitees who attended from all over the Andhra Desa, numbered about 1,000.

The national flag was hoisted by Sri D. Sanjeevayya, Minister for Co-operation and Commercial Taxes. Sri N. Sanjeeva Reddy, Deputy Chief Minister inaugurated the Conference. Sri Kalavenkata Rao, Minister for Planning and Industries inaugurated the Scientific and Pharmaceutical Exhibition. The Scientific session was inaugurated by Dr. A. B. Nageshwar Rao, Minister of Local Administration and Major K. N. Rao presided. The conference of Family Planning was inaugurated by Sri Kalaventaka Rao, Minister for Public Health. Dr. S. S. Hussain was the chairman of the Reception Committee and Dr. P. Veeraiah Chowdary presided over the conference.

Dr. Hussain, the Chairman of the Reception Committee accorded a hearty welcome to the delegates and guests. In his speech he narrated the history of Kurnool and referred to its various attractions. Dr. P. Veeraiah Chowdary, the President of the Conference, in his address spoke as follows :

"As an Independent Nation, we have embarked upon a programme of national reconstruction in an orderly fashion. So we have the dawn of an age of planning. In the first Five-year Plan Period progress is recorded in several sectors. Health and medicine constitute one such sector. Progress recorded in this sector however is not in proportion to the needs of the people. In another three months from now we will have the second Five-year Plan come into effect. In this plan emphasis is laid mainly on the industrial reconstruction of the nation. Yet the importance of the agricultural aspect of reconstruction cannot be minimised. The two together pose questions of considerable significance to us connected with medicine and health. Therefore, we have to remember that we cannot be of much use and service unless we relate the problems of health and medicine to industry, labour and agriculture. Economically, we are backward. The bulk of the people constitute labour. In the period of the last 8 years, we find an improvement in the per capita income. Still, it is a fact that compared with countries of the west, the standard of living of our people is low.

Status and Influence of I. M. A.

It is to an India of this problem that we are to dedicate ourselves for service. We, the I.M.A. have been in existence for 32 years. We have just completed the Thirty-second Conference of the Indian Medical Association at Jaipore. We are happy about this. But there is cause for concern. To illustrate this the following facts may be mentioned :

The membership on rolls is 17, 711 and the strength of the medical profession is 65,000 in Indian Union. In Andhra State the medical profession consists of 3,000 practitioners.

It also pains me to point out that either at the Union level or State level, we do not receive recognition as a potential health unit. In America, Great Britain and other western countries the medical associations find an honoured place in plans made and laws passed. Therefore the question to solve is to find for ourselves a status similar to that of the medical Associations in the west. One thing which we should immediately do is to strengthen ourselves in as many ways as possible including the enlistment of members.

Let us now proceed to picture to ourselves the sphere in which we have to play our role in the work of reconstruction along the lines of building up the health of our people.

Public Health.

In present day India which is predominantly rural and poor, public health still constitutes a major problem, in spite of the steps taken so far by the Government.

Dr. S. S. Hussain, the Chairman of the Reception Committee

To illustrate this fact, let me mention a few facts : (a) There is the fact of mortality—infant and maternal—together with the fact of deaths due to preventable and communicable diseases. Infant mortality has of course come down but still the rate is very high so far mothers are concerned, roughly 200,000 mothers die during childbirth every year.

(b) A study of statistics of all States in India shows that the heavy death rate in our country is due to cholera, gastro-intestinal diseases, malnutrition, anaemia, preventable and communicable and water borne diseases. All competent authorities are one in emphasising the fact that impure water is responsible for many infectious gastro-intestinal troubles. In the Public Health

report of Bombay, 1953, it is said "the prevention of cholera is essentially dependent upon the provision of safe water supply in urban and rural areas". Secondly, the Health Officer of Calcutta Corporation is of the opinion that the most important single factor contributing to the spread of the disease is the scarcity of filtered water.

In Hyderabad the deaths due to cholera in 1953-54 are 21,723, in Uttar Pradesh the deaths from cholera alone are 11,155 and the death from dysentery and diarrhoea are 34,459, in Orissa deaths due to gastro-intestinal diseases are 18,206.

(c) The caloric intake is lowest in the world.

The fact that in 1954 the caloric was 1,641 though the national value is about 3,000 caloric intake, will help to suggest the enormity of the problem.

(d) Scientific medical relief in modern times is becoming increasingly costly. This renders it difficult for the common man to make use of it even in economically advanced countries. Therefore, the dependence of patients on hospital and institutional treatment is increasing. But hospital beds are not sufficient.

Such then is the picture of the state of public health in our country. The question that we are to ask is what solution can we think of for this problem. I have got a few suggestions to make towards evolving a solution. Some of them are as follows :

1. Preventive measures. 2. Extension of scientific medical relief to rural areas. 3. Proper measures for achieving positive health. 4. Promotion of medical education and research.

Now a word about each of these four suggestions.

Preventive measures : One of the measures to prevent a disease is to provide for better nutrition. The best way of dealing with nutrition is to correct the diet as a whole and to supplement it with vitamins whenever necessary. But a note of caution should be made. Vitamins are being over used, that too indiscriminately. Practitioners are to be conscious of the complications like vitamonosis. The predominent interest in nutritional research has now shifted from vitamins towards protein deficiency. The animal protein is supposed to be the best. In our country shortage of protein is the vital factor in bringing about nutritional disease particularly in children during the critical post-weaning period.

Reconstituted skimmed milk is very effective in combating the nutritional oedema in children. In this connection special mention should be made of UNICEF for supplying to us this costly reconstituted skimmed milk for the benefit of our children. A suggestion should also be made that the Government and public should stress the fact that adulterating agencies should be dealt with severely so that neither suppliers of milk nor recipients like hotel keepers use adulterated milk and ghee.

Fish is found to have the best protein. The Food and Agricultural Organisation has made available fishing facilities for the production of protein in large quantities. Animal Husbandry Department has also to be expanded in the direction of producing more food through dairy farming, poultry development etc.

Milk must certainly rank high in any food schedule for South India. Bombay city has taken the lead in regular supply of pure pasteurised milk. We should also follow their example. I am glad to inform that two pasteurised schemes are sanctioned by our state, one for Kurnool and the other for Guntur Milk Supply Union. But it is not enough. We have to follow the example of Australia where every State has legislated for a supply of pure milk to primary school children in all the states. The Milk Pasteurisation Act of 1945 compels all the dairy farms to sell only bottled and pasteurised milk.

It is needless to say that many of the diseases are water-borne and preventable. Therefore, effective steps should be taken by the implementation of National Water Supply Scheme in rural and urban India as well. Attention is invited to the World Health Organization Expert Committee's remarks about water supply scheme. "The annual cost of typhoid fever, diarrhoea and enterites for 100,000 inhabitants has been estimated dollars 58,265. The installation of proper water supply of sewage systems for the same population would cost dollars 138,000. It would thus appear that the savings to be derived from the reduction of the diseases would pay off the cost of installation in a short span of 3 years."

For financing and managing water supply scheme, a National Water Supply Corporation must be started. Government and the public will have to arrange the needed finance in our country.

One of the commonest diseases in our country is malaria. Filaria though found confined to certain regions is dangerous and it seems to be spreading. The toll taken by these diseases is very heavy. Steps already taken have resulted in arresting to some extent the progress of malaria. Yet, the need for the development of anti-malarial and anti-filarial projects is urgent. In the Second Five-year Plan, the Government have suggested the establishment of 4 anti-malarial units. But it is not sufficient to deal with the problem. Along with an extension of such units, there should be a development in our state of an Institute of Research in malaria and filaria.

Extension of Scientific Medical Relief : There is an urgent need to provide all people with equal opportunities for medical care whether they be in cities or villages. But it is a fact that there is a dearth of medical personnel. There is a general complaint that the medical graduates do not go to villages. For example there are only 65,000 doctors to serve 36 crores of people. It is not realised by the critics that that this is not as if doctors are not animated by a sense of service. They are to remember that doctors are men of science. They wish to keep in touch with the latest development in the field of medicine and health. Therefore, they would like to be in hospitals which provide them with ample clinical facilities. It is hoped that like the Soviet Union our Government would give more pay to those who work in villages than to those in towns and provide for residence, education for children etc., and after 3 years of service in a village they should have an opportunity for specialisation in specialist institutions. There are also shortage of beds and lack of money. Yet, in order that medical relief be made available equally to all some steps need be taken immediately. First among them is the establishment of rural health units at the rate of one per taluk of 100 villages. It is a matter for gratification that our State Government is providing for 15 such units in the Second Five-year Plan. But it is inadequate. To make the rural health units positively helpful there should be a Board to plan and guide the rural health schemes properly. Another step is to augment auxiliary medical personnel. At present there is one nurse for every 43,000 persons; one midwife for every 60,000 people. This has to be raised to one nurse for every 2,000 and one midwife for every 5,000. It is again gratifying to note that our State Government has provided in the Second Five-year Plan for training 475 nurses, 90 auxiliary nurses and midwives.

Proper measures for achieving positive health : Several schemes are at work. Some of them commended for consideration are as follows :

(a) Compulsary New Health Insurance Scheme :— Every Swede and every foreigner in Sweden who has attained the age of 15 has to become insured. Children under 16 are automatically insured through their parents, generally the father. The benefits are as follows :—

(1) Medical benefit, which includes (a) payment towards the cost of medical association. (b) Free hospitalisation. (c) Payment of costs incurred in travelling to a doctor or hospital or back home. (d) Pharmaceutical preparations free of cost in certain cases, and at a discount in others.

(2) Sickness benefit.
(3) Maternity benefit : New items of note in this scheme are the allowance for travelling to and from doctors and hospitals, pharmaceutical preparations in connection with qualifying diseases free of cost, and state contribution for licensed remedies. The outstanding features of the scheme is that it is compulsory and covers all the population.

(b) Family Planning :—The increase in human races is characterised by geometric progression. There is an addition of 34 million a year to population. Every day witnesses the birth of 88,000 children. The increase in food is characterised by arithmetic progression. This is resulting in malnutrition and under nourishment. Clearly this is most undesirable. Therefore, the need for family planning and birth control. The present methods of birth control used in the west are too expensive and eloborate for poor simple people in our country. Therefore an effort must be made to find a cheap simple method such as a pill of some sort to be swallowed. Such a discovery may involve an eloborate research.

(c) To achieve positive health, special attention must be bestowed on three important problems, viz., (1) Blindness, (2) Tuberculosis and (3) Cancer and Research.

Blindness : Blind people according to statistics available come to about 360,000. According to a survey in Bengal in 292 villages, the incidence was 100,000, the maximum recorded being 26 per cent to 100,000. In the States where the trachoma is prevalent, the rate increases. The sample survey further reveals that 50 per cent of the blindness is curable, 42 per cent preventable, 8 per cent only being unavoidable. It is also to be noted that most of the persons doomed by circumstances to become blind can be saved from this catastrophe, if necessary steps for prevention and cure are taken properly. The most representative blind person is the poor, illiterate, simple villager, whose ignorance of hygiene marks him out as the natural prey of the quack. What is the remedy? The campaign for the prevention of blindness through health propaganda should be taken to the very door of the village. People should be taught about the general hygiene of the eye, and should be impressed about the necessity of seeking medical aid at the earliest sign of any disease. The public should be warned about the danger of failing a prey to the quack. Preventive vaccination against small pox and inoculations against typhoid and cholera are essential. Explain to them the complications arising from venereal diseases and warn them against Ophthalmic Neonatorum Conjunctivitis in various forms to be tackled early. Nutritional disorders should be met by balanced diet and essential protein. Care for prevention of injuries to the eye in games, festivals, occupational hazards should be taken.

Tuberculosis : According to the statistics available 5 million people are suffering from tuberculosis and 2 million people die of tuberculosis every year. The cause as you know consists of undernutrition, poverty and insanitary environments and habits. In order to tackle this effectively, the Government should encourage the private sector and voluntary organizations to come forward to aid in the promotion of the preventive and curative measures. In our State there are three or four Sanatoriums with a bed strength over 100. Guntur is planning to construct a Sanatorium for 150 beds and the Tuberculosis Association is awaiting the permission from the Government to construct it on Government site at Mangalagiri. I am happy to mention that in this project the Chief Minister of our State is evincing a personal interest.

In the Second Five-year Plan, there should be an extension of facilities to eradicate this disease. There should be a plan to provide in very taluk one Tuberculosis Diagonistic Clinic with 10 beds attached, in very district, one Central Institute for isolation and treatment and in every zone of three or four districts, one chest clinic with 50 beds attached to it. Each chest clinic should have several units with facilities for domicilary treatment. Steps also should be taken to make an extended use of B.C.G.

Cancer and Research : Cancer is a deadly disease and it is second to tuberculosis in causing heavy death rate throughout the world. For the last 30 years intensive research has been taken up by the medical people to find out the cause and proper medicine for its cure. Still we are groping in the dark. However, cancer control campaign in various forms and curative therapy through radium, deep X-ray, Isotopes etc., are being carried out to the best of their ability in all the countries. In Andhra, the facilities for treating cancer are very limited, though cancer is wide spread. The Government and the public will do well to embark upon a scheme to start several cancer clinics and develop one or two specialist institutions in the course of the Second Five-Year Plan Period.

DR. P. VEERAIAH CHOUDARY, THE PRESIDENT OF THE CONFERENCE

In the Second Five-Year Plan no adequate provision is made for cancer clinics or institutes while provision is made for tuberculosis and leprosy cure. This is due to want of funds. I suggest to our Government and the Planning Minister to raise money. State Cancer Association has to be organized also to facilitate propoganda and to develop adequate curative measures.

Manufacture and Control of Drugs : Sri T. T. Krishnamachary expressed regret at the delay in implementing the report of the Pharmaceutical Inquiry Committee at the 8th Pharmaceutical Congress inauguration recently at New Delhi. He pleaded for the centralised control of drugs in the country and the elimination of what he calls "back street manufacturing shops". But this is not to be understood as a war against indigenous effort, but it is only a move to ensure the supply of cheap but efficient drugs.

The Pharmaceutical Committee sounded a note of warning against buying drugs from hawkers, walking chemists or general provision stores and grocers because they quote lower rates than licensed Chemists and Druggists. New drugs and patents are being put into the market without testing the efficacy and safety. Many of the drugs reveal the inertness and disadvantages after using for a year or so.

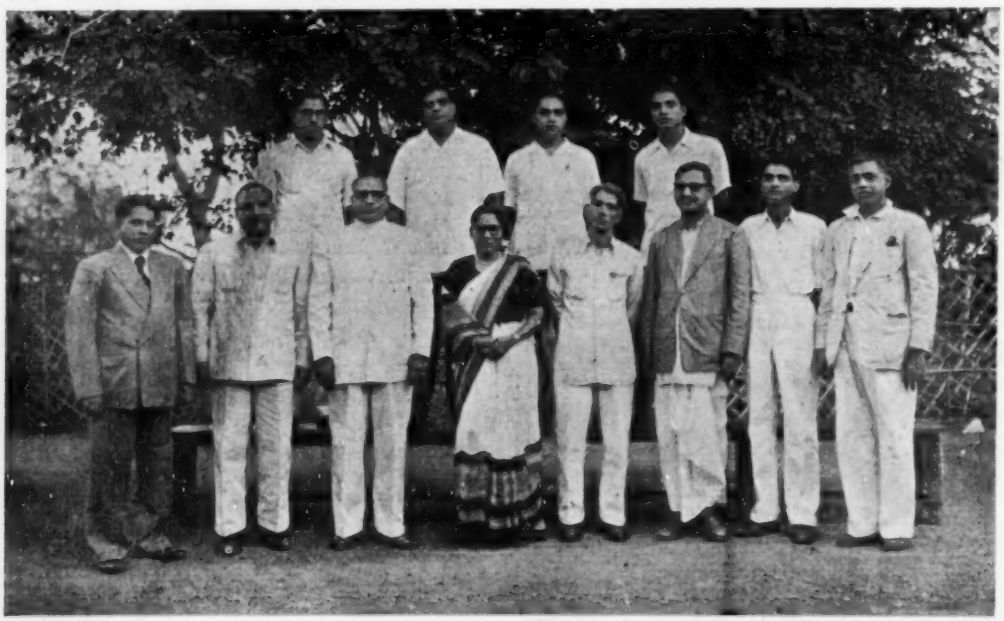
It is high time that we begin to manufacture in our country the basic chemicals and other drugs and prohibit the import of such at a high cost. We cannot appreciate any longer our manufacturers continuing as tablet makers, refillers of samples with foreign medicines, bottlers etc. The Government should avail of the opportunity given under foreign aid to secure the machinery and technical assistance to convert ourselves into a self-sufficient nation. Major General Sokhey and our Ambassador in Russia informed recently, that Russian Government is willing to give all possible assistance on the manufacturing side.

Promotion of Medical Education and Research : The existing facilities for medical education and research are limited. The number of medical colleges are 38. The Standard varies from State to State. The percentage of passes is low. The institutions for research are few. It is clear, therefore, that public health cannot be positively built up in this kind of environment. This gives to us a task to-day. In that task the following things will have to find a place :

First, the Government College of Indian medicine which produces inferior type of medical men is in need of either being ended or mended. Secondly, a number of institutions to provide for specialisation and research similar to the School of Tropical Medicine, All India Institute of Hygiene and Public Health, Malaria and Nutritional Institute of Conoor, the King Institute of Madras etc. should be developed. For want of research facilities and specialist training many of us are compelled to go abroad. While in some cases a visit to the West is indispensable, it is clearly undesirable to waste so much of money and time on study abroad. Speaking about our own State I may be permitted to say that University of Andhra may seriously consider the desirability of developing an Institute for this purpose. To start with, it may be permitted to assume responsibility for the management of the Andhra Medical College at Vishakapatnam. Thirdly, besides institutes of specialist nature, another step should be taken to increase the number of medical colleges. We are happy to note that the Andhra State intends to develop two colleges in the Second Five-Year Plan period, one immediately at Kurnool, and another at Tirupati or so. These two colleges alone will not serve our purpose. Hence private agencies should become busy to explore the possibility of opening a medical college either at Elura at Kakinada.

Associated with the problem of increasing the number of medical colleges is the problem of developing a uniform standard of medical studies all over the country. Along with an improvement in standard of teaching and learning also should take place an increase in the number of passes. This can take place only if special opportunities for training in teaching and the establishment of an Institute of Post-Graduate Research are provided. In our State it is necessary that steps are taken to have such Post-Graduate Research Institute developed as a part of Andhra University at Waltair. In this Institute specialisation in teaching also should be developed.

Fourthly, a maternity and paediatric department can be developed at Guntur. If as a result of the formation of Visalandhra, the High Court is to be shifted to Hyderabad, the proposed department can be located in the present High Court buildings. Further we have only two clinics for venereals and one dental clinic. There is no dental college at all. In this field too development is the need of the day. Fifthly, along with institutional developments there should be an addition to personnel too. It is a welcome move in the Second Five Year Plan, that provision is made for training 475 nurses auxilary midwives, 1,800 dais, 20 health inspectors in leprosy, 10 health visitors in Tuberculosis, 250 sanitary inspectors and 10 public health engineers. Though this plan is commendable it falls short of recommendations of



EXECUTIVES OF THE RECEPTION COMMITTEE

the Bhore Committee. We should therefore exert ourselves to realise the object of providing one doctor for every 2,000 people, one nurse for every 500 people and one midwife for every 5,000 people. Sixthly, we are to meet the demand in our State for 130 primary health centres, 160 hospitals, 409 dispensaries, 11 special hospitals and 2 or 3 medical colleges. It is a difficult financial proposition. Yet we cannot afford to give up development.

A scheme must be prepared to find the needed personnel. In that scheme consideration may be given to the following suggestions :

1. Re-employment of retired people up to the age of 60-65 years.
2. Recruitment into the service from the independant profession.
3. Senior people with distinction of merit after 10 years of service to be taken as Civil Surgeons.
4. Recruitment as assistant surgeons below 10 years of experience.
5. To invite and fit into honorary scheme as many as possible.
6. Recruitment of specialists on contract basis for a period of 5 to 10 years particularly on the teaching side.
7. Private profession should be considered as an extension of the official section in our country.

Lastly, Indigenous System of Medicine : This system of medicine has survived many an attack and is now emerging as a factor to reckon with. We are happy to note that an Ayurvedic Research Institute at Jamanagar is started. It is, therefore, hoped that Ayurveda, Homeopathy, Sidda and Unani will come increasingly under the spirit of science and make a contribution to the preventive and curative aspect of disease. My suggestion to my colleagues and others is to explore the possibility of bringing about an integration of what is good in the various systems of medicine at post-graduate level.

Before I conclude my speech I wish to bring to your particular consideration the last though not the least aspect of our responsibility in the task of National Reconstruction. The concept of State which originally started as a police state to protect life and property of the citizens has undergone a radical change. We now hear of politicians both of advanced Western democracies and less advanced Eastern countries talking of welfare state. In any welfare state health plays a vital role and along with it the doctors. This indeed calls for a re-orientation of our outlook and a re-eamination of the existing systems both on the preventive and curative sides of medicine to see how far they contribute towards the creation of a welfare state. No doubt many of us agree that radical and revolutionary changes are called for. These changes in the health set-up of the country cannot be brought about except on the basis of the partnership of the medical profession, the public and the Government. Therefore, I feel that if we pursue our activities with missionary zeal we can contribute a great deal even under the given circumstances to the health and happiness of our country men.

* * * * *

The following resolutions were passed at the Conference.

1. Resolved to thank the Andhra Government for sanctioning a Medical College of modern medicine to be started at Kurnool from 1st July 1956.

2. Resolved to request the Andhra Government to move the Central Government to start a medical college of modern medicine under its Second Five Year Plan at Thirupathi, the Headquarters of Sri Venkateswara University.

3. Resolved to recommend to Andhra Government to institute a Post-Graduate Department with chair in Ayurvedic studies and research in the medical colleges in the Andhra State.

4. Resolved to support the B.C.G. vaccination campaign of the Government. This conference is of the opinion that this should be done under satisfactory conditions of production, distribution, administration, follow up and individual treatment wherever necessary with proper recording of cases.

5. Resolved to request the Government to have the Biochemistry Department block of building in the Andhra Medical College, Visakhapatnam to be named after the late Dr. Y. Subbarao, the renowned Andhra Research Scholar who died in U.S.A., and the Guntur Medical College be named after the late Srimathi Rukmini Lakshmipathi who, as a minister for Health and Medical, was the founder of the medical college at Guntur.

6. Resolved to request the Government to expedite the formation of the Andhra Medical Council with no further delay with suitable amendments to the Madras Council Act.

7. Resolved to request the Government to sanction a special allowance of Rs. 100/- per month and free residence for all medical officers appointed for service in rural areas.

8. Resolved to request the Government to provide residential accommodation in all urban and rural areas for all medical and public health officers in view of the dearth of the same. In its absence a house rent of Rs. 50/- and Rs. 25/- per month respectively may be sanctioned.

9. Resolved to request the Government that the regular dispensaries of modern medicine now under local bodies and municipalities be taken over and managed directly by the Government itself.

10. Resolved to recommend to Government of India to start Regional Institutes for training of teaching personnel and specialists for service in the Medical Colleges.

11. Resolved to recommend to the Government that there should be uniform scale of pay for all medical officers in the country in the service of the State or the Central Government or Local Bodies or Municipalities and it should be in no way less than the scales of pay of the officers in the other technical branches or of the same rank in other departments.

12. Resolved to request the Government to increase the subsidy of the Rural Medical Practitioners of modern medicine in the Andhra State to Rs. 125/- per month and also provide every dispensary with a full time servant.

13. Resolved to request the Andhra University to open L.O. course in Ophthalmology at the Andhra Medical College to enable medical practitioners of modern medicine to take the post-graduate training in the speciality.

BRANCH NOTES

PORBANDUR BRANCH—A meeting of the branch was held on 13-10-55 with Dr. M. M. Nanawati in the chair. Thirteen members were present. Dr. N. D. Mehta of Junagadh spoke on 'Integrated Health Service".

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A special meeting was held on 29-10-55 to congratulate Dr. P. R. Trivedi on his being elected as senior Vice-President of the Indian Medical Association. Dr. P. B. Pandya presided. The following medical films were shown (1) Respiratory Stimulant Coramine, (2) Nupercaine Heavy Solution Anaesthesia, (3) Lymph Vessel Studies in the Mesentery of rat.

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The annual general meeting of the branch was held on 18-9-55 with Dr. C. R. Shah in the chair. Office bearers for 1955-56 were elected with Dr. H. H. Chavda as president and Dr. K. W.& Waghela as secretary. The Statement of accounts of the branch for 1954-55 was presented by the secretary. Budget for 1955-56 was also presented. Drs. R. R. Soneji, P. B. Pandya, B. N. Joshi and B. P. Dave agreed to conduct the medical examination of the school children of H. M. Middle School of Porbandar. Dr. R. R. Soneji read a paper on Vitamin B_{12}.

SECUNDERABAD BRANCH—A general meeting of the branch was held on 16-10-55. Dr. L. D. Khatri, Director Medical and Health Services Hyderabad spoke on Second Five Year Plan of the Medical Department in the Hyderabad State. Office bearers were elected with Dr. N. K. Murthi as president, Dr. A. S. Puntabekar as Hony. Secretary and Dr. (Mrs.) B. Pento as Hony. Joint Secretary. The Government of Hyderabad was requested to put down quackery and to bring into force immediately the Indian Drugs Act 1949 and the Indian Pharmacy Act of 1948.

SHILLONG BRANCH—The annual general meeting and annual dinner were held on 28-10-55. Fiftyeight members were present. Dr. J. Frimodt-Moller of Arogyavaram was the chief guest. He spoke on "Modern Treatment of Pulmonary Tuberculosis."

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A meeting was held on 8-11-55. Twentyseven members were present. Dr. Sudhir Bose, Director Professor of Obstetrics and Gynaecology, Medical College, Calcutta, spoke on "White Discharges in Women."

SULTANPUR BRANCH—The annual report for 1954-55 shows that 6 general meetings were held during the year and scientific discussions were also held in the meetings. Office bearers for 1955-56 were elected with Dr. P. C. Tandon as president and Dr. R. C. D. Garg as hony. secretary.

TARAKESWAR BRANCH—The annual meeting of the branch was held on 5-11-55. Thirty members were present. Office-bearers for 1955-56 were elected with Dr. S. K. Gupta as president and Dr. R. K. Goswami as secretary. The annual report for 1954-55 shows that the branch fought for the improvement of health centres, gave voluntary assistance to local hospital during need, made joint examination of complicated cases on meeting dates. During this year 9 general meetings and 1 special meeting were held.

The annual report of the branch for 1954-55 shows that the membership has slightly increased. The president of the branch is negotiating with the Mohanto Maharaj of Tarakeswar for a plot of land whereupon a house for the branch might be erected. Office bearers for 1055-56 were elected in annual meeting held on 5-11-55, with Dr. S. K. Gupta as president and Dr. R. K. Goswami as Secretary.

TIRUCHY BRANCH—The annual meeting of the branch was held on the 29th and 30th October 1955, with Dr. N. C. Subramanyam in the chair. The meeting at the outset condoled the tragic death of Dr. K. Rangaswamy, a member of the branch. Dr. D. Kanakasabesan of the Medical College, Trivandrum spoke on "Surgical Emergencies in Infants". Dr. Miss H. Erickson of the Swedish Mission Hospital, Tirupattur gave a talk on "What can be done to ameliorate the handicaps of the deaf." On the second day of the meeting office-bearers were elected with Dr. Enok as president and Dr. V. Ananthagiri as secretary. Dr. A. Vanugopal of the Government General Hospital spoke on "Surgery of the Breast Tumours", Dr. M. D. Ananthachary of Madurai Medical College spoke on "Some basic facts in relation to Hypertension", Dr. S. T. Narasinmhan spoke on "Electroclinical correlations in Epilepsy" with Epidiascope projection. Dr. Kalyanaraman spoke on "Congenital Heart Diseases". A film on "That the deaf may speak" was shown.

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The inaugural meeting of the branch was held on 19-11-55 with Dr. V. Enok in the chair. Sixty members were present. After the routine business was over, Dr. P. K. Krishnan Kutty of Stanley Hospital spoke on "Diagnosis and treatment of Coronary Thrombosis."

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A meeting of the branch was held on 17-12-55 with Dr. V. Enok in the chair. Thirty five members were present. Dr. T. M. Srinivasan, Madras spoke on "Diseased Ear".

UTTAR PRADESH STATE BRANCH—A meeting of the working Committee of the branch was held on 27-11-55 at Bareilly. Seven members were present. Dr. Durga Prasad presided. At the outset, the members condoled the death of Dr. H. L. Dube, Meerut; Dr. D. R. Sharma, Muzaffarnagar; and Major H. R. Kapur, Agra. The annual report of the secretary, the audited annual Accounts for 1954-55, the Budget for 1955-56 were presented and adopted. The names of the five candidates selected for interview for internships were announced. The invitation from Dehra Dun to hold the next year's conference was referred to the Annual meeting for acceptance. Amendments to the Rules and Bye-laws of the State Branch were accepted.

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The annual meeting of the State Branch was held on 28-11-55 with Dr. Durga Prasad in the chair. Twenty three members were present. The annual report for 1954-55, the audited accounts for 1954-55 and the budget for 1955-56 were adopted. Office bearers were elected with Dr. S. P. Gupta (Lucknow) as hony. state secretary, Dr. J. M. Singh (Dehra Dun) and Dr. N. Chandia (Kanpur) as joint secretaries. The invitation of Dehra Dun, Branch to hold the next year's conference was accepted.

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The annual report of the branch for 1954-55 shows that membership increased during the year by 88. The State Council met on 31-10-54, the State Working Committee thrice during the year, meetings being held at Kanpur, Banaras and Lucknow.

VISAKHAPATNAM BRANCH—The general body meeting of the branch was held on 26th November, 1955 with Dr. B. R. J. Iyengar in the chair. After a short period the meeting closed and the members participated in a clinical meeting held by the King George Hospital staff.

WEST KHANDESH BRANCH—A meeting of the branch was held on 30-10-55 with Dr. Paithankar in the chair. Dr. R. B. Chaudhury delegate for the peace conference at Helsinki talked on "The Medical Relief work in Russia".

X GUJARAT & SAURASHTRA PROVINCIAL CONFERENCE.

Under the auspices of the Gujarat & Saurashtra Provincial Branch of Indian Medical Association, Annual Conference of Medical Men of Gujarat & Saurashtra will be held at Navasari from 12th to 14th May 1956. Along with the Conference there will be an Exhibition of Pharmaceutical Products and Medical and Surgical Appliances. For details please write to Dr. R. G. Dasai, Co-operative Bank Building, Navasari. (W. Rly.)

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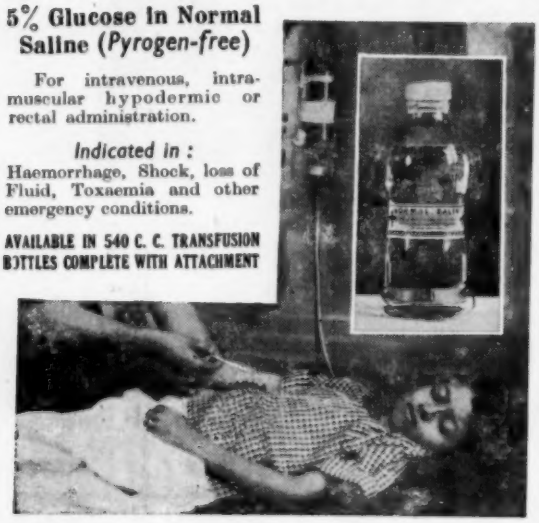

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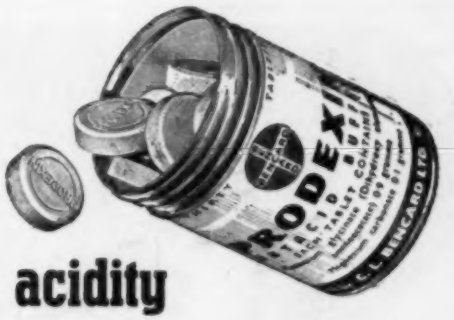

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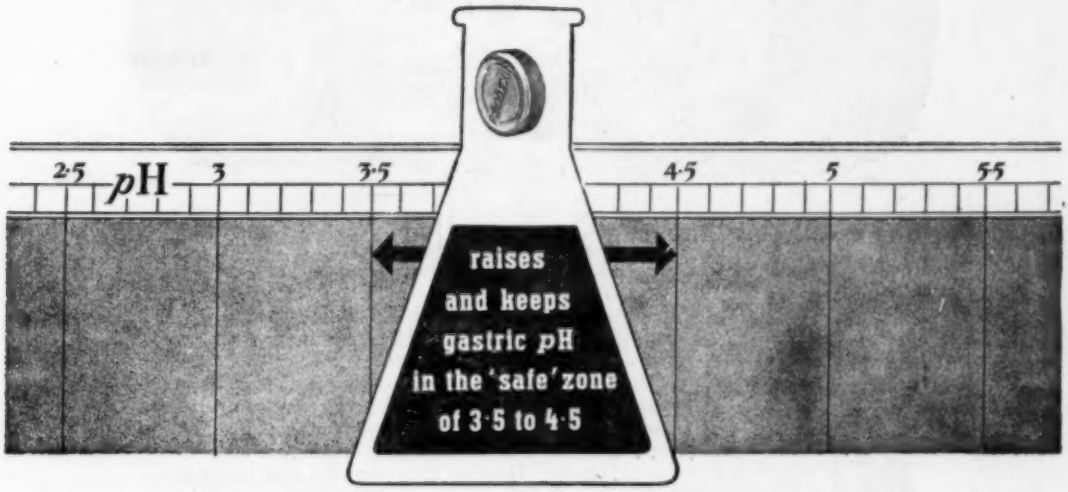

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